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M E M O R A N D U M

TO: John Mitnik, Chief, Engineering and Construction Bureau
Paul Linton, Administrator, Water Control Operations Section

FROM: SFWMD Staff Environmental Advisory Team

DATE: July 5, 2016

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Kissimmee

On Sunday, stage in East Lake Toho, Lake Toho, and Kissimmee-Cypress-Hatchineha was 0.5 feet below schedule. Over the past week, discharge at S65 averaged 857 cfs and at S65A 1,211 cfs; discharge at S65E averaged 2,991 cfs. Tuesday morning discharges: S65 ~386 cfs; S65A ~663 cfs; S65C ~1,936 cfs; S65E ~2,227 cfs. Dissolved oxygen in the Kissimmee River averaged 2.21 mg/L over the past week and 2.37 mg/L on Sunday. Kissimmee River mean floodplain depth on Sunday was 1.18 feet. Snail Kites have ten nests in the northern Phase I area of the Kissimmee River floodplain.

Lake Okeechobee

Lake Okeechobee is at 14.95 feet NGVD having remained essentially static over the past week despite continued releases through S77 and S308 and seasonally high evapotranspiration. The Lake remains in the Low Flow Sub-band. Lake levels are too high for this time of year and there is a potential for negative impacts to submerged aquatic vegetation. Various data sources indicate the presence of dense cyanobacterial blooms and associated toxins on the Lake and in downstream canals.

Estuaries

Total freshwater inflow to the St. Lucie Estuary declined 718 cfs to a weekly average of 2,768 cfs. Flow from the Lake was 1,727 cfs (62% of total flow). Salinity increased throughout the estuary. However, the seven-day average salinity at the US1 Bridge remained in the poor range for adult oysters. In the Caloosahatchee Estuary, total freshwater inflow also continued to decrease averaging 7,157 cfs, 1,060 cfs less than last week. Flow from the Lake was 3,139 cfs (44% of total flow). Salinity conditions in the upper estuary are suitable for tape grass. Salinity remained in the poor range for adult oysters at the Cape Coral Bridge, and in the good range at Shell Point and Sanibel. The 30-day average salinity at the I-75 Bridge is below 5.

Stormwater Treatment Areas

Over the past week, the STAs/FEBs received approximately 400 acre-feet of Lake regulatory releases. The total amount of Lake regulatory releases sent to the STAs/FEBs in WY2017 (since May 1, 2016) is approximately 22,500 acre-feet. All STA cells are at or above target depths. Operational restrictions are in place for vegetation rehabilitation in STA-1E, STA-1W, STA-3/4 and STA-5/6 and structure repairs are underway in STA-1E. In addition, nests of ESA and/or MBTA-protected species have been observed in STA-1E, STA-1W, and STA-5/6. This week, if 2008 LORS recommends Lake releases to the WCAs and the conditions allow, releases will be sent to the A-1 FEB, and A-1 FEB releases will be sent to STA-2 and STA-3/4.

Everglades

Stages generally increased this week with the largest measured change of 0.33 feet in WCA-3B. The 30-day moving average salinity at the Florida Bay MFL site has decreased to 2.2 psu and the cumulative 365-day inflow from the five creeks into Florida Bay increased to 285,377 acre-feet.

Weather Conditions and Forecast

A drier week ahead with afternoon seabreeze thunderstorms focused west. An upper level low over the southeastern Gulf of Mexico will develop thunderstorms mainly west this afternoon but drier air moving into southeastern area should suppress shower development over the eastern portions of the District. This drier air is forecast to spread across the southern portion of the District and decrease overall daily thunderstorm coverage Wednesday through Friday. Moisture and daily thunderstorm activity should begin recovering to more typical levels Saturday and Sunday.

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 1.94 inches of rainfall in the past week and the Lower Basin received 1.73 inches (SFWMD Daily Rainfall Report 07/01/2016).

Upper Kissimmee Basin

Stages and departures in the Kissimmee Chain of Lakes (KCOL) are shown in Table1.

Table 1. Departures from KCOL flood regulation (F) or temporary schedules (T, A, or S) (feet NGVD). Discharge and stage data are provisional real-time data from SFWMD OASyS DualTrend; reported values are averages through midnight of the Sunday prior to the report date unless otherwise specified.

Report Date: 7/5/2016							Sunday Departure (feet)						
Water Body	Structure/Site	Discharge (cfs), week's average**	Stage Monitoring Site***	Lake Stage (feet)	Schedule*	Regulation (R) or Target (S or T) Stage (feet)	7/3/16	6/26/16	6/19/16	6/12/16	6/5/16	5/29/16	5/22/16
Lakes Hart and Mary Jane	S62	126	LKMJ	60.0	R	60.0	0.0	0.0	0.4	0.0	-0.5	-0.1	0.2
Lakes Myrtle, Preston, and Joel	S57	39	S57	61.0	R	61.0	0.0	0.0	0.1	-0.4	-0.9	0.0	0.2
Alligator Chain	S60	0	ALLI	63.1	R	63.2	-0.1	-0.5	-0.6	-0.8	-1.2	0.0	0.2
Lake Gentry	S63	179	LKGT	61.0	R	61.0	0.0	0.1	-0.1	-0.8	-1.4	0.0	0.3
East Lake Toho	S59	275	TOHOE	56.0	R	56.5	-0.5	-0.7	-0.5	-0.6	-0.6	1.0	0.8
Lake Toho	S61	697	TOHOW, S61	53.0	R	53.5	-0.5	-0.8	-0.8	-0.5	-0.5	1.1	1.0
Lakes Kissimmee, Cypress, and Hatchineha	S65	857	LKISSP, KUB011, LKIS5B	50.5	R	51.0	-0.5	-1.0	-0.8	-0.8	-0.8	1.6	1.9

* T = temporary schedule, R = USACE flood control schedule, S = temporary snail kite schedule, A = projected ascension line, N/A= not applicable or data not available.

** Seven-day average of weighted daily means through Sunday midnight.

*** Names of in-lake monitoring sites and structures used to determine lake stage; if more than one site is listed, an average is reported.

Lower Kissimmee Basin

Discharges and stages at Lower Basin structures are shown in Table 2. SFWDAT depth maps for the Phase I restoration area are shown in Figure 12. Kissimmee River floodplain stages at selected stations are shown in Figure 13.

Table 2. Mean weekly discharge at S-65x structures, and mean weekly Phase I area river channel dissolved oxygen and floodplain mean water depth. Discharge and stage data are provisional real-time data from SFWMD OASyS DualTrend; reported values are averages through midnight of the Sunday prior to the report date unless otherwise specified.

Report Date: 7/5/2016

Metric	Location	Sunday's 1-day average	Weekly Average**									
			7/3/16	6/26/16	6/19/16	6/12/16	6/5/16	5/29/16	5/22/16	5/15/16	5/8/16	5/1/16
Discharge (cfs)	S-65	191	857	2431	3194	3940	2899	4304	2029	1480	1091	1125
Discharge (cfs)	S-65A	747	1211	2890	4455	5649	3348	6187	4379	1352	1143	925
Discharge (cfs)	S-65C	2069	2741	4168	6224	5091	4792	6914	3320	1603	1337	1543
Headwater stage (feet NGVD)		34.0	34.0	34.1	34.1	34.1	33.9	34.2	34.3	34.1	34.3	34.0
Discharge (cfs)	S-65D****	2449	3108	4552	7361	5471	5186	7868	2979	1641	1391	1584
Discharge (cfs)	S-65E	2375	2991	4458	7216	5255	5005	7470	2873	1531	1268	1471
DO concentration (mg/L)***	Phase I river channel	2.37	2.21	1.66	0.77	1.44	0.48	0.72	3.62	6.06	5.94	5.65
Mean depth (feet)*	Phase I floodplain	1.18	N/A	1.93	2.33	3.12	1.75	2.81	3.09	0.71	0.80	0.57

* 1-day spatial average from South Florida Water Depth Assessment Tool (SFWDAT).

** Seven-day average of weighted daily means through Sunday midnight.

*** DO is the average for PC62 and PC33 starting June 2. PC33 omitted for week of Aug16. DO for week of Sept 15-22 is for PC33 only.

**** S-65D discharge combines discharge at S-65D, S-65DX1, and S-65DX2.

***** 1-day spatial average from field measurements in Pools A and BC.

Water Management Recommendations

Kissimmee Basin Adaptive Recommendations and Operational Actions

Date	Recommendation	Purpose	Outcome	Source
6/30/2016	Ramp down S65/S65A discharge by 150 cfs per day to 650 cfs and hold at 650 cfs until lake stage rises to Zone A of the schedule. When stage enters Zone A, ramp up S65 discharge to 1,400 cfs as stage rises from 0.0 to 0.6 feet above the regulation line unless there is a large rainfall event. This ramp up schedule will be reevaluated when the regulation schedule reaches 52.0 feet NGVD.	The ramp down in S65/S65A discharge is intended to lessen the impact of Lake Okeechobee releases on naturally occurring algal blooms. Holding discharge at 650 cfs reflects consideration for the Snail Kites nesting in the Kissimmee River floodplain.	Implemented	SFWMD Operations Control
6/28/2016	No new recommendations.			
6/21/2016	No new recommendations.			
6/14/2016	No new recommendations.			
6/7/2016	No new recommendations.			
5/31/2016	No new recommendations.			
5/24/2016	No new recommendations.			
5/17/2016	No new recommendations.			
5/10/2016	No new recommendations.			
5/3/2016	No new recommendations.			
4/26/2016	No new recommendations.			
4/19/2016	No new recommendations.			
4/12/2016	No new recommendations.			
4/5/2016	No new recommendations.			
3/29/2016	No new recommendations.			
3/22/2016	No new recommendations.			
3/15/2016	No new recommendations.			
3/8/2016	No new recommendations.			
3/1/2016	No new recommendations.			
2/23/2016	No new recommendations.			
2/16/2016	No new recommendations.			
2/9/2016	No new recommendations.			
2/1/2016	Begin F&W recessions in East Toho, Toho, and KCH per the requested recession lines shown in the 2015-16 Dry Season Standing Recommendation (SR). Use Table 2 for guidance on rates of change in discharge to control departures from the line in KCH, and the reversal guidelines shown in the SR for Toho and East.	Initiate and manage lake stage recessions in East Toho, Toho, and KCH for the benefit of fish and wildlife, while avoiding harm to the Kissimmee River	TBD	KB Tech Team
1/20/2016	Continue to adjust discharge at S65 to follow the 2015-16 Dry Season SR guidelines for rampdown at S65A. Balance discharge at the two structures to maintain at least minimum discharge to the river. As stage rises above 51 ft in KCH, temporarily bypass the Fig 1 discharge plan in the SR and manage discharge to let KCH stage rise to 51.5 ft (the Feb 1 recession starting stage) if conditions allow while following rampdown guidelines. If KCH stage rises further than 51.5 ft, we will reevaluate. As changes in discharge become necessary, continue to follow the Table 1 guidelines in the SR. Switch to Table 2 rampup/rampdown guidelines on Feb 1 or when the recession line is intercepted for management of the recession in KCH.	If conditions allow, let stage increase to 51.5 ft to intersect the Feb 1 starting stage for KCH F&W recession line.	Implemented	KB Tech Team

KCOL Hydrographs (through Sunday midnight)

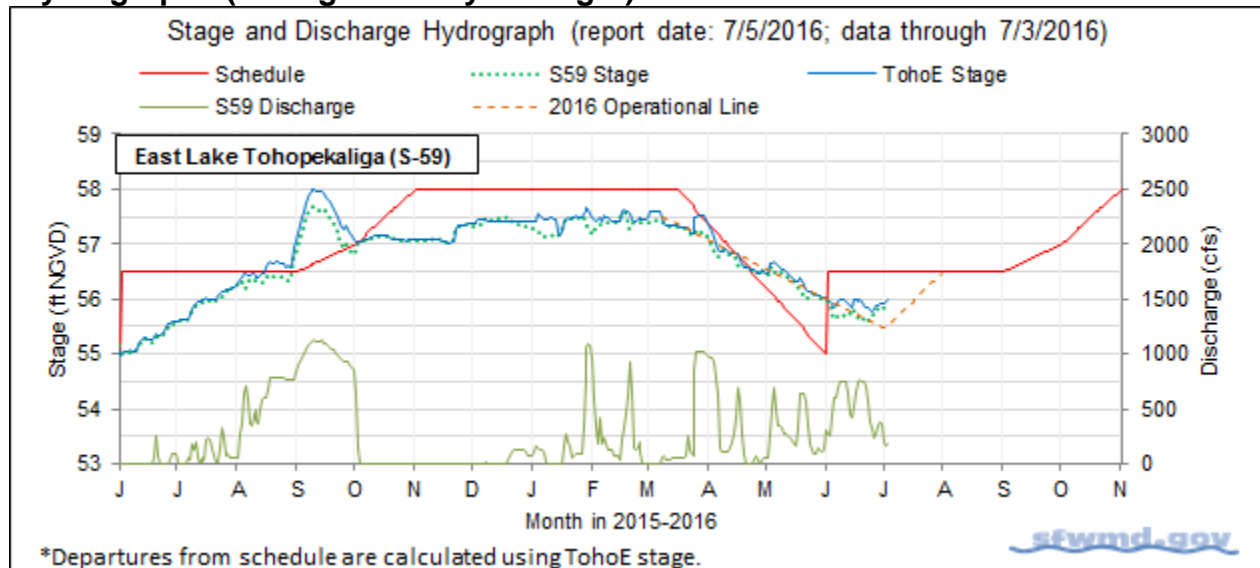


Figure 1.

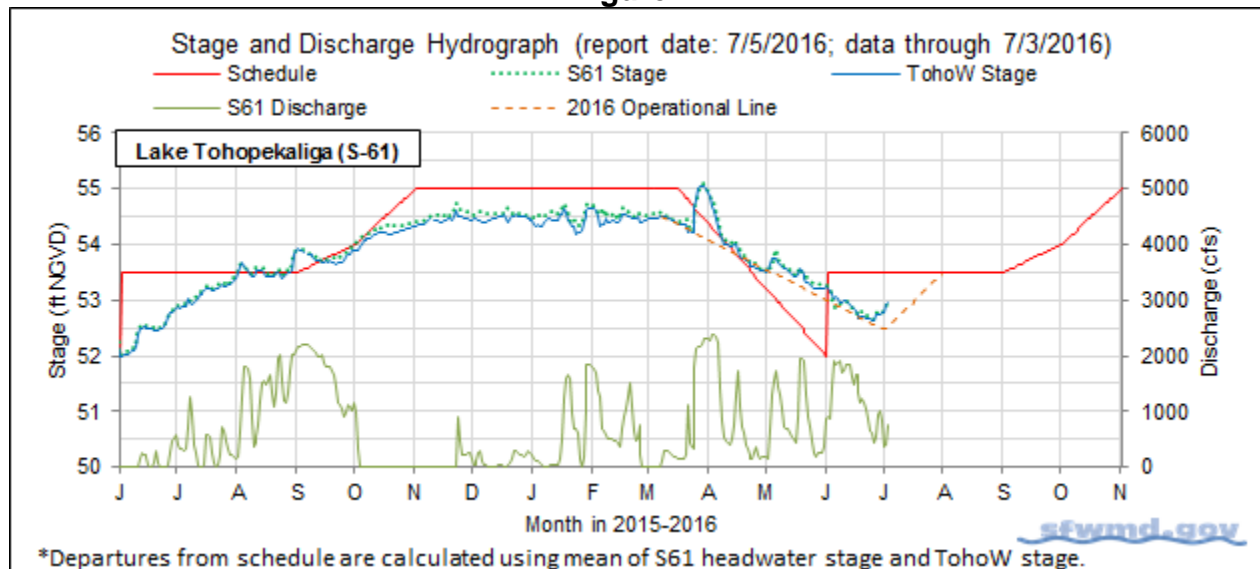


Figure 2.

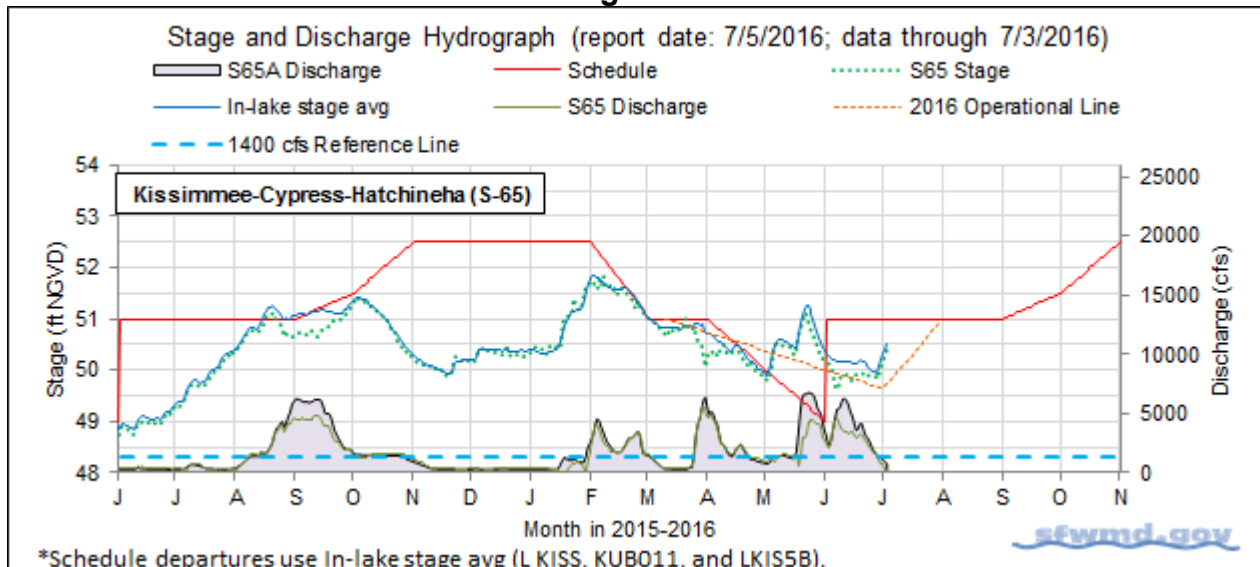


Figure 3.

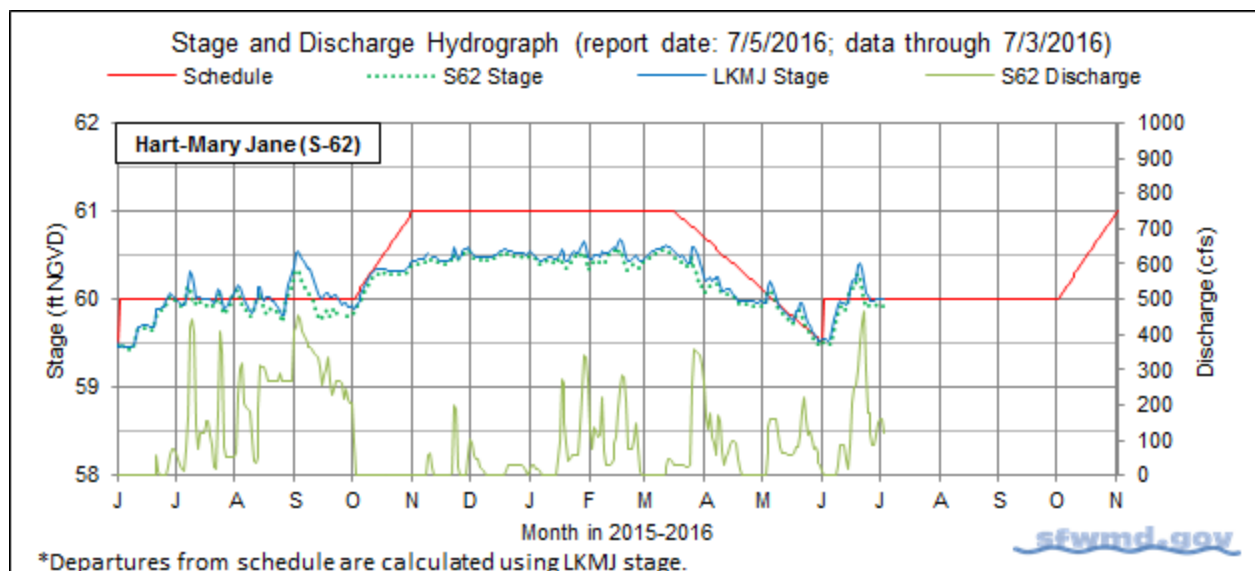


Figure 4.

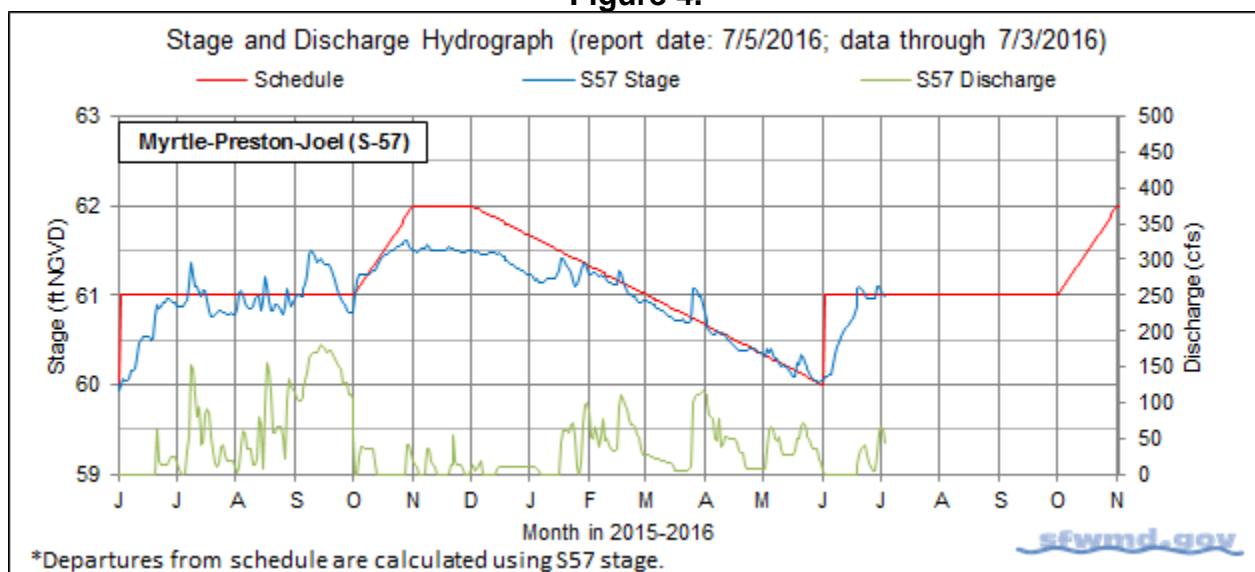


Figure 5.

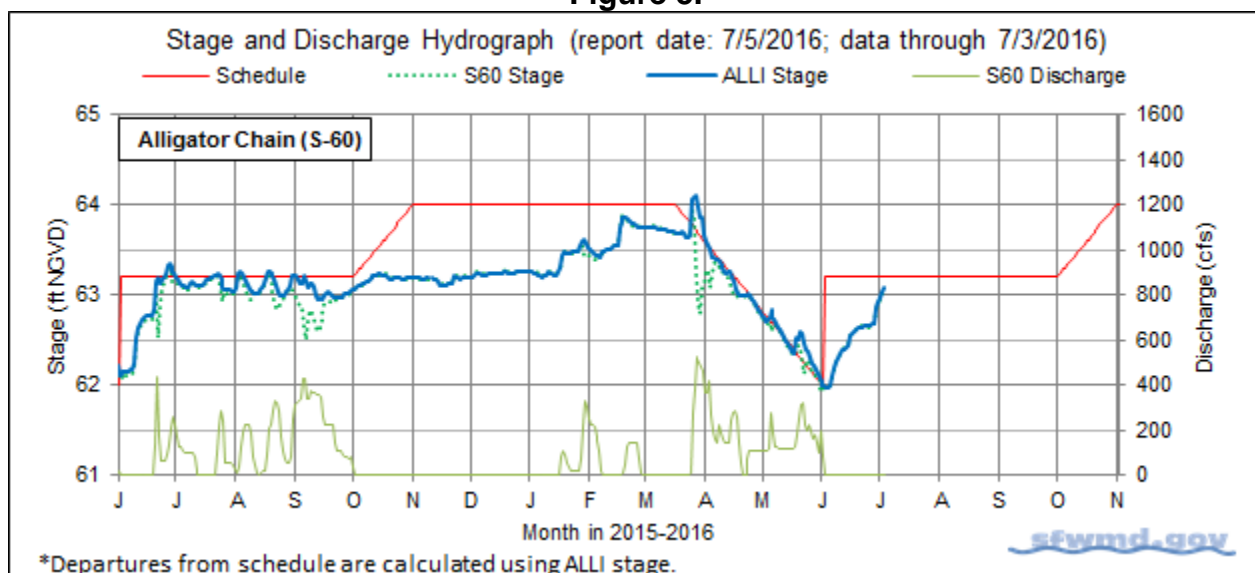


Figure 6.

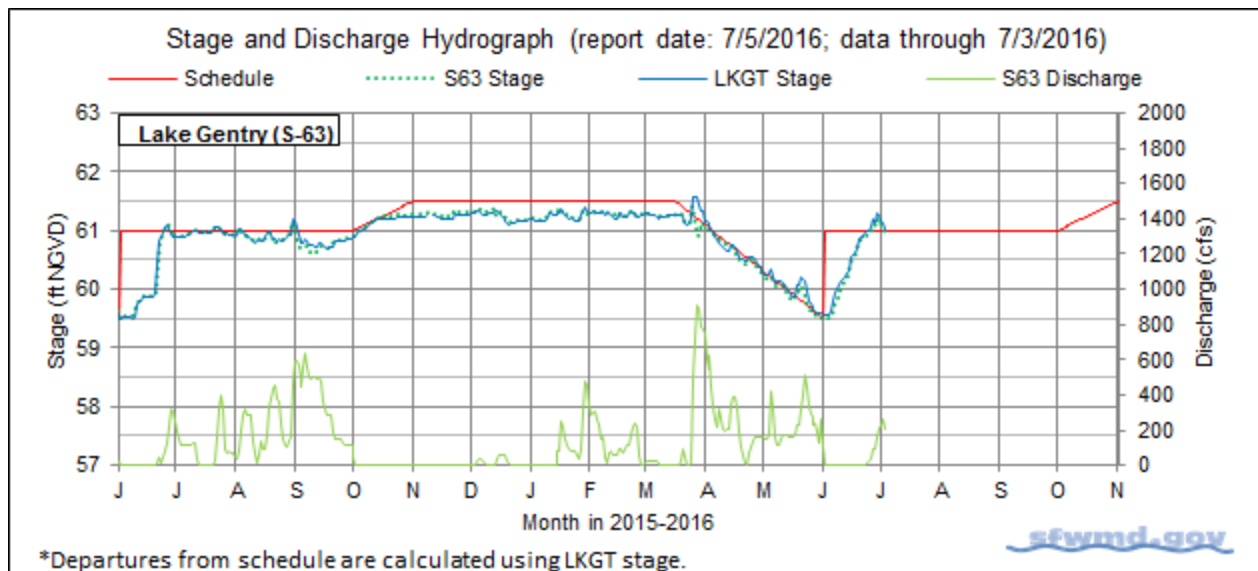


Figure 7.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT			
Limits on Rate of Discharge Change at S65/S65A During Wet Season 2016			
Discharge Rate of Change Limits for S65/S65A (revised 6/30/16).			
Rate limits apply only in Zone B			
	Q (cfs)	Maximum rate of increase (cfs/day)	Maximum rate of decrease (cfs/day)
Zone B	650-1450	150	-150
	1450-1700	250	-250
	1700-2600	300	-300
	2600-3000	400	-400
	>3000	1000	-1000
Zone A	No limits		

Figure 8a. Limits on rate of discharge change at S65/S65A for the 2016 Wet Season.

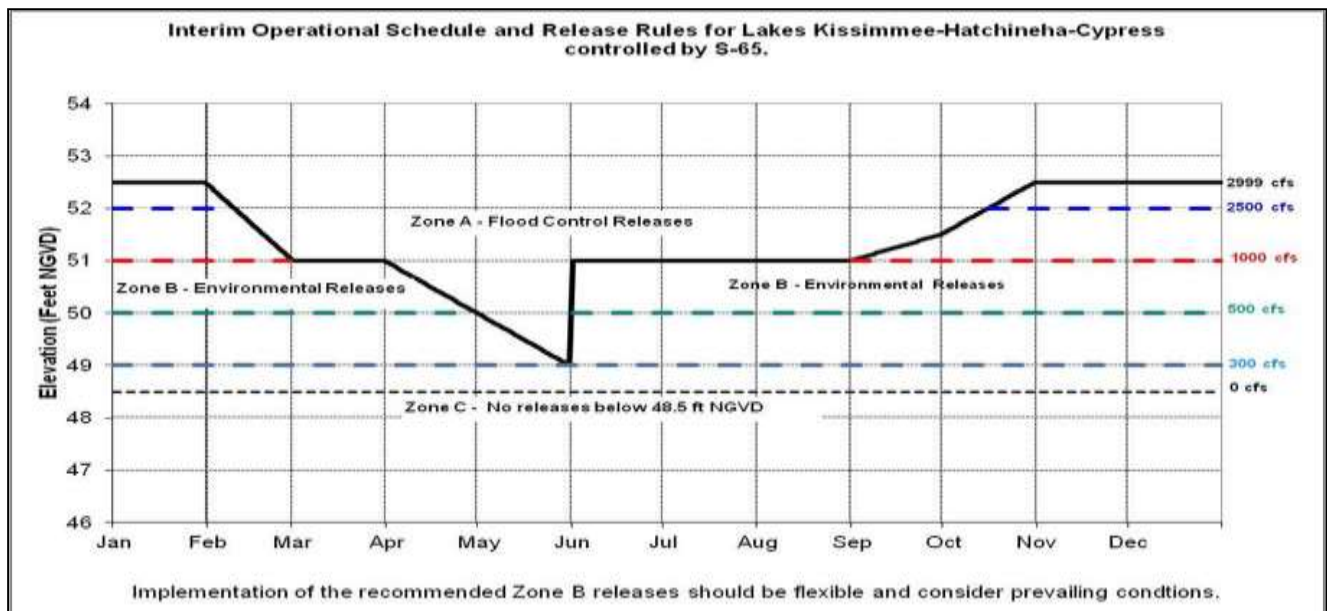


Figure 8b. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years or in Wet Season 2015.

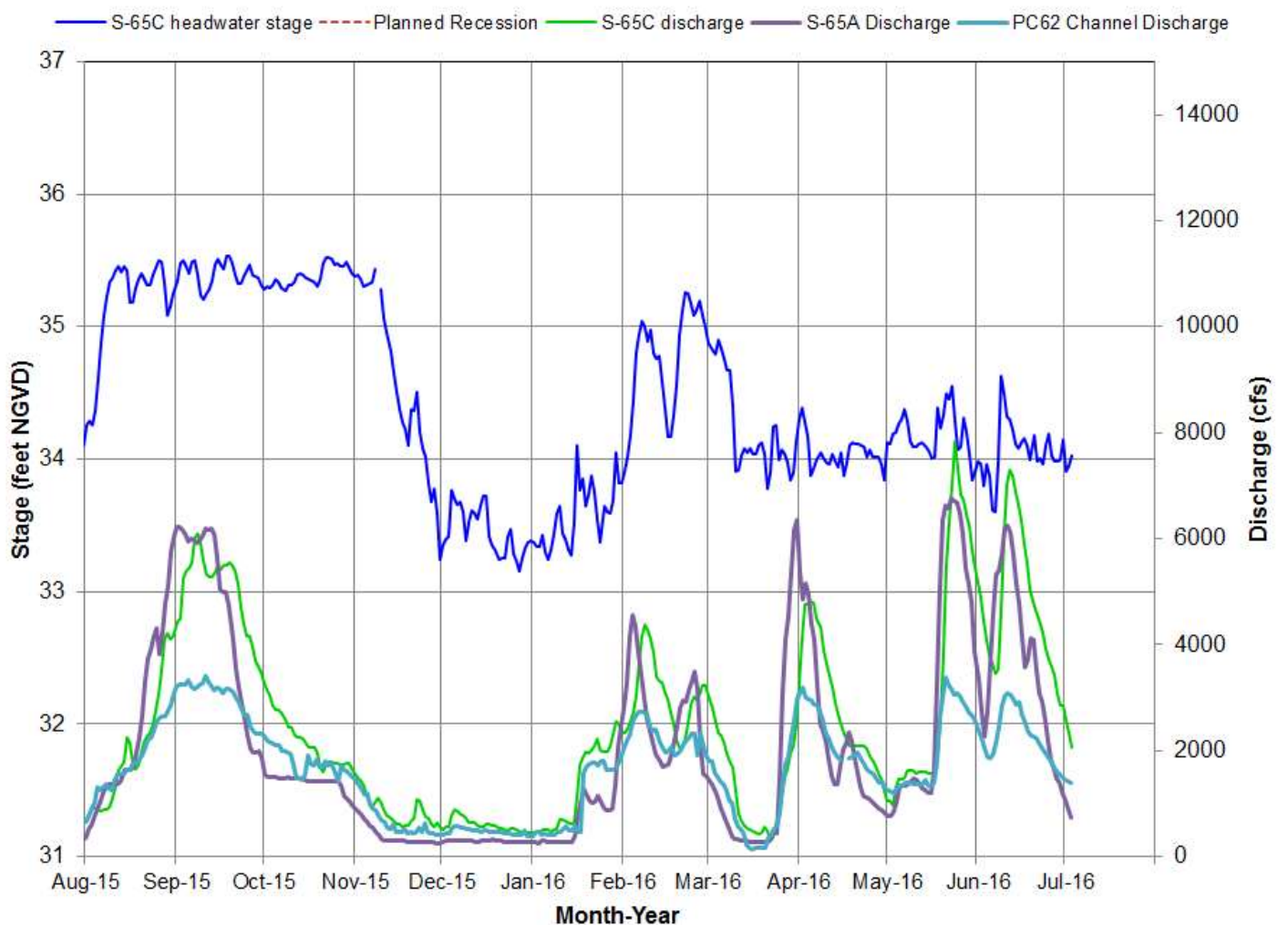


Figure 9. S-65C headwater stage in relation to discharge at S-65C, S-65A, and PC62.

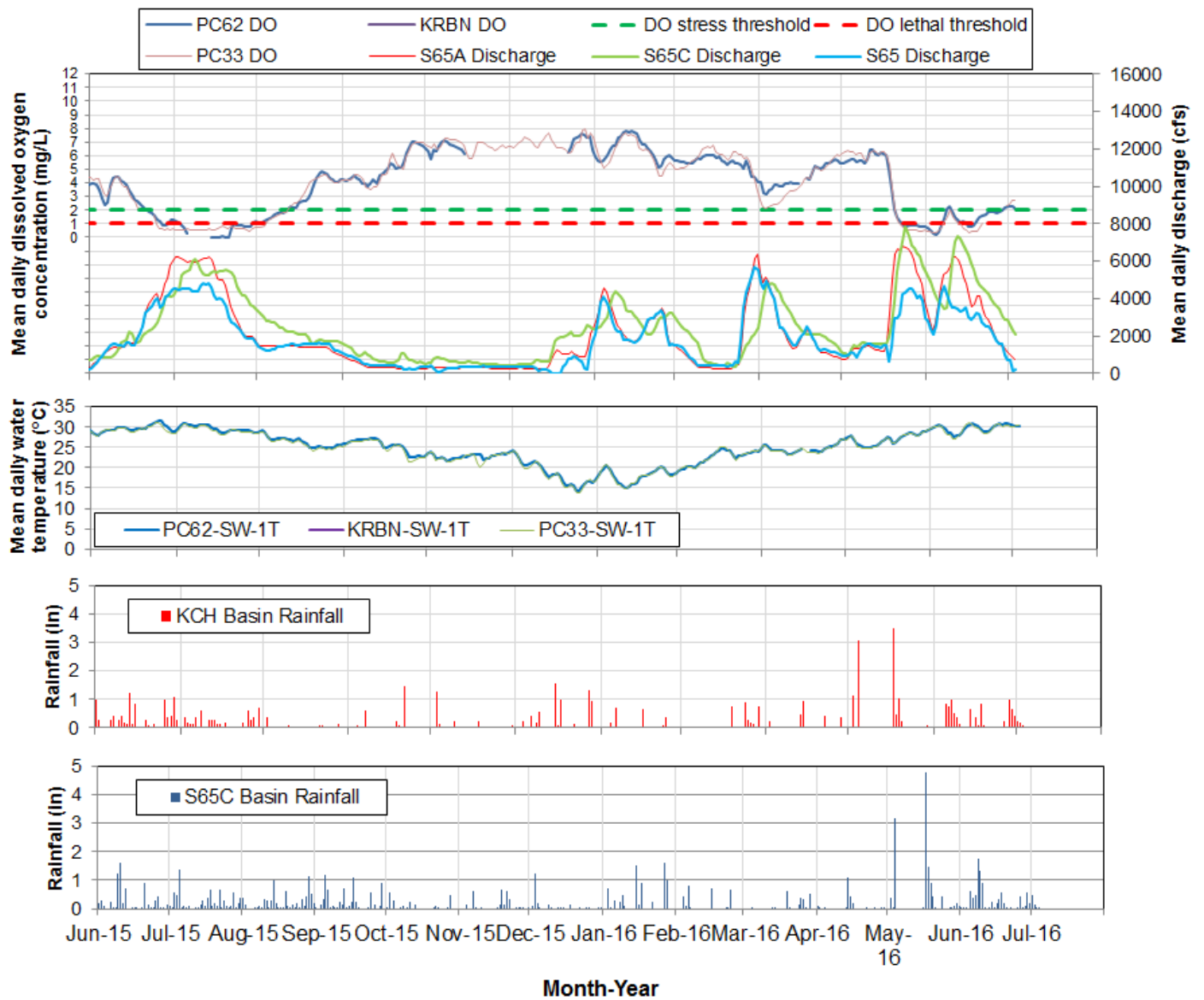


Figure 10. Mean daily Dissolved Oxygen, discharge, temperature and rainfall in the Phase I river channel.

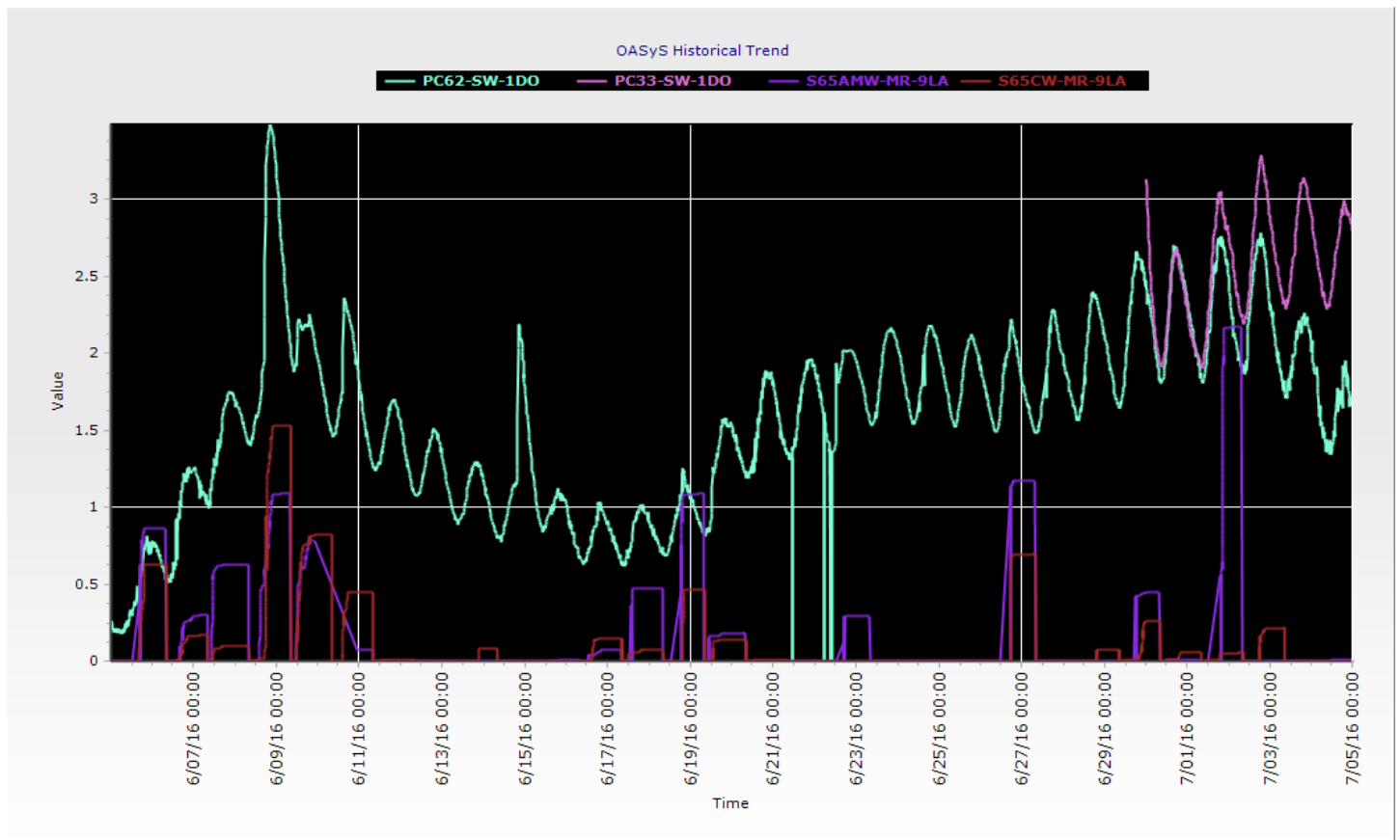
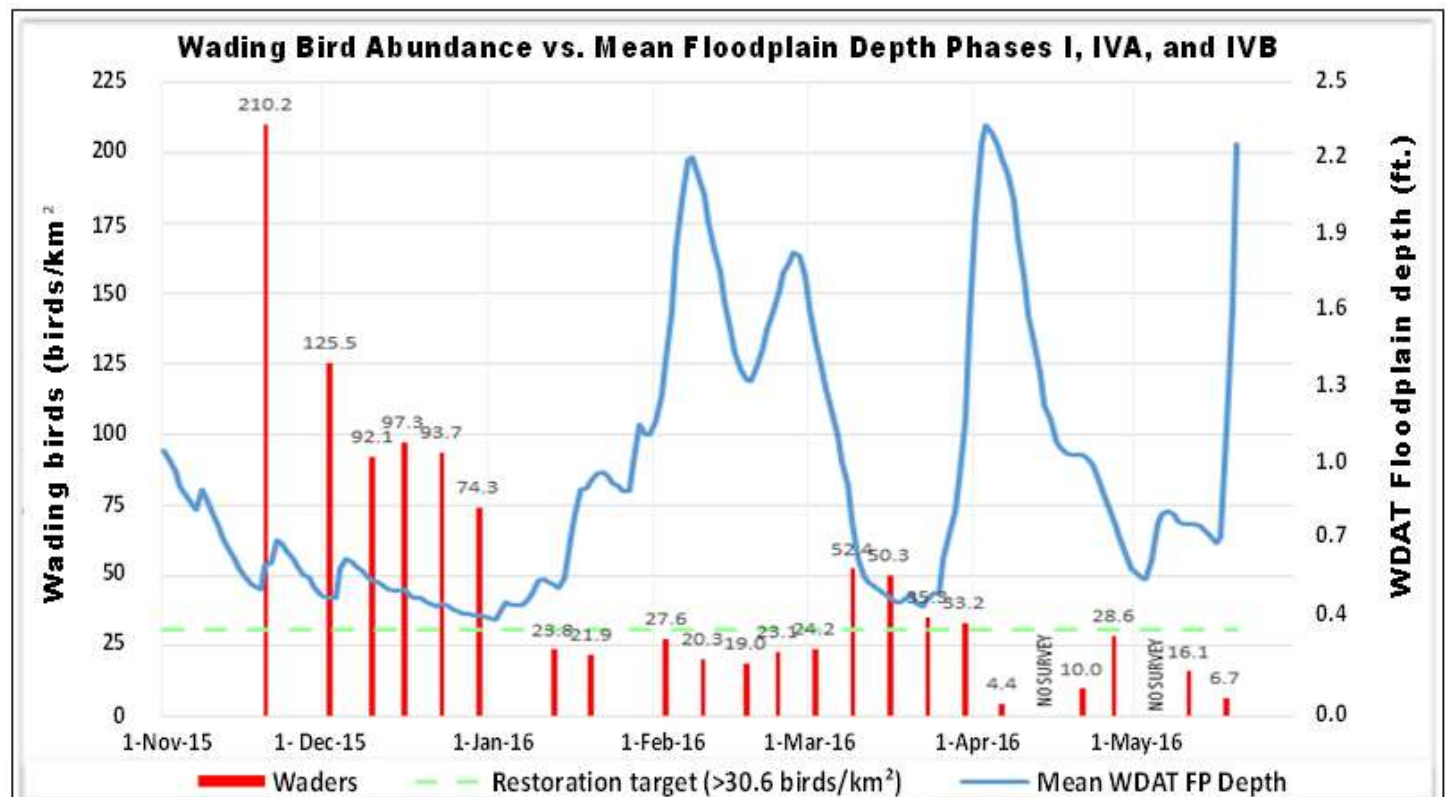


Figure 11. Phase I river channel dissolved oxygen (measured at 15 minute intervals) and rainfall at S65A and S65C.



Insert 1. Wading bird abundance on the Kissimmee River floodplain in 2015-2016 dry season. Stage reversals (increases in water depth) are caused by increases in flow at S65/S65A following rainfall. Stage reversals affect the ability of wading birds to use floodplain habitats because they cannot forage in water that is too deep.

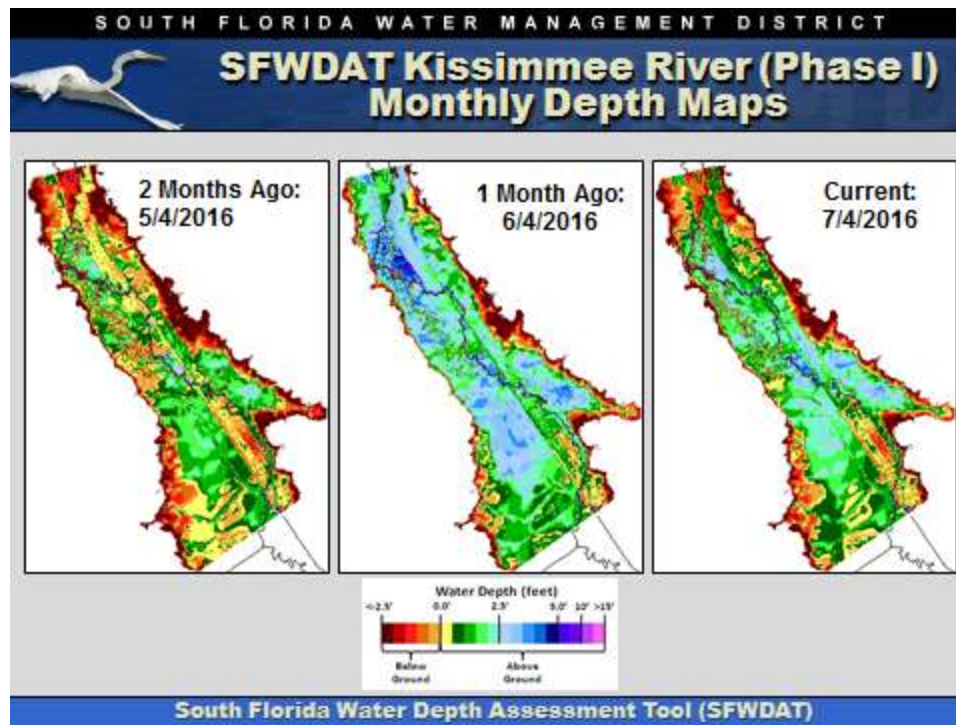


Figure 12. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to Jan. 16, 2012.

Kissimmee River Hydrographs

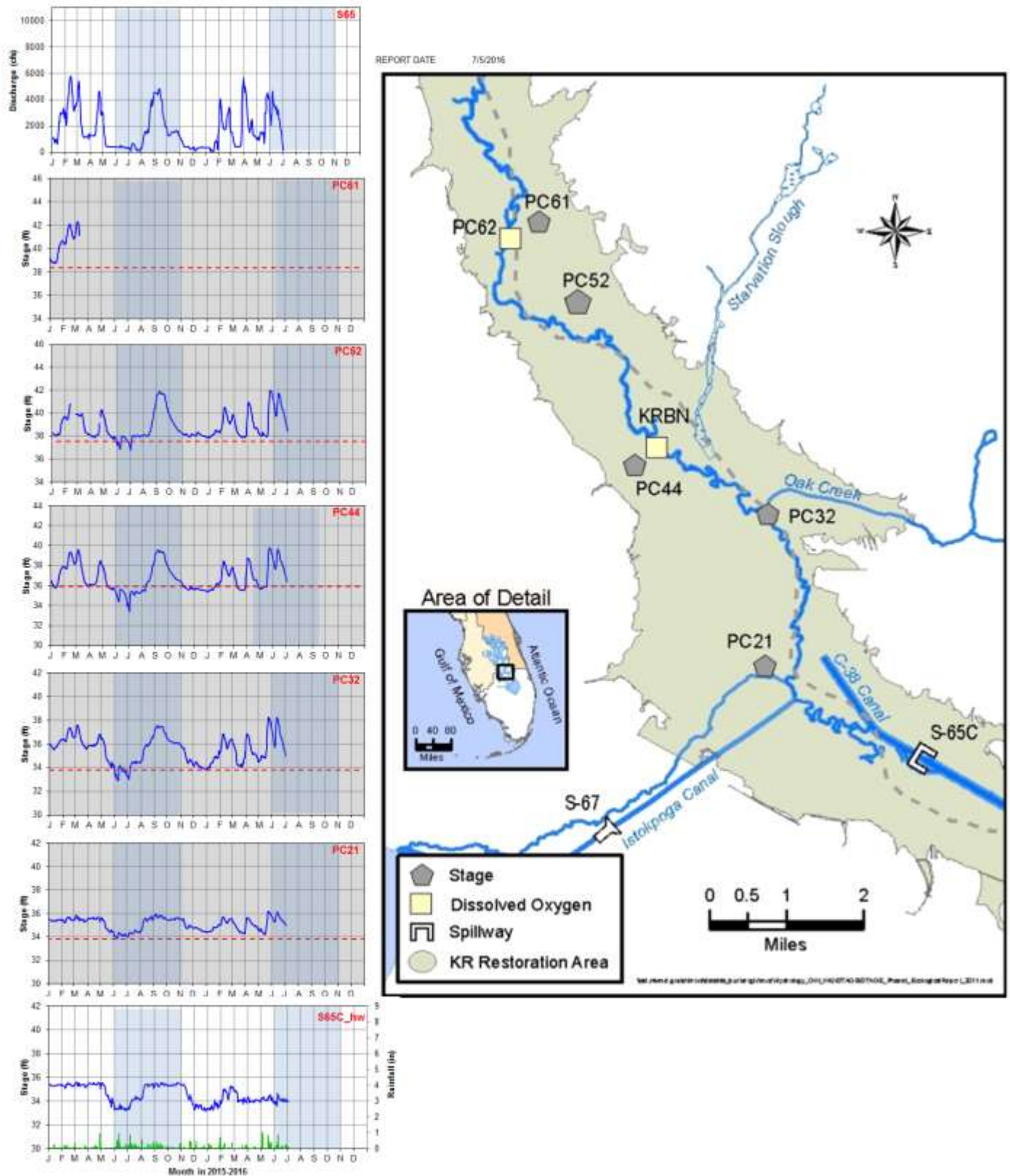


Figure 13. Discharge at S65, stages at five monitoring stations in the Phase I area of the Kissimmee River floodplain, and headwater stage at S65-C since January 1, 2015. The most recent data (~2 weeks) are provisional real-time data from SFWMD DualTrend; previous data are from SFWMD DB-HYDRO (validated). Dashed lines are ground elevations.

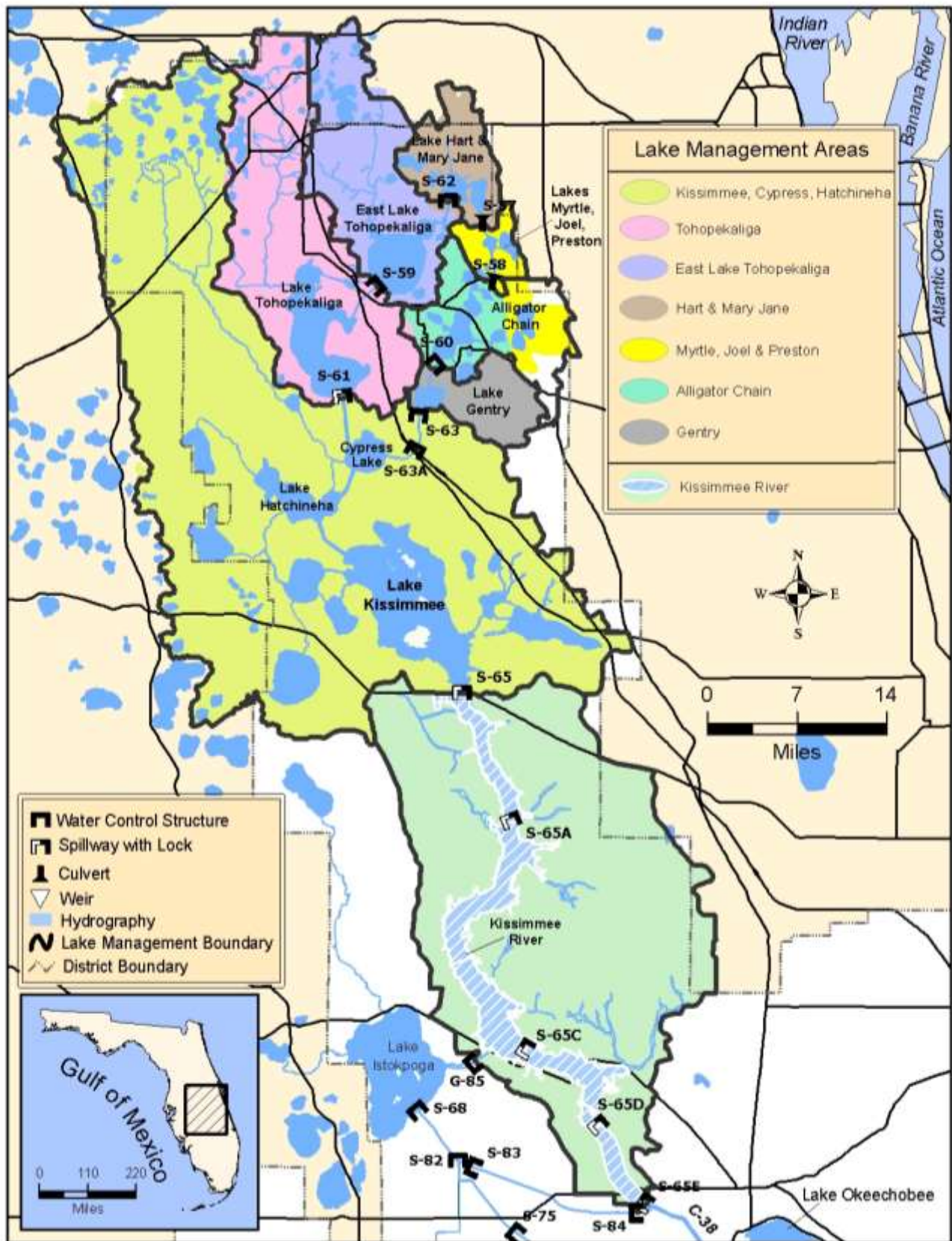


Figure 14. The Kissimmee Basin

LAKE OKEECHOBEE

According to an estimate based on USACE web site data from July 3, 2016 (the last date that the website was updated) Lake Okeechobee stage is at 14.95 feet NGVD. This value is based on the use of four interior Lake stations (L001, L005, L006, and LZ40) and four perimeter stations (S352, S4, S308 and S133). Lake stage increased marginally (0.05 feet) over the past week and is 0.64 feet higher than it was a month ago and 2.81 feet higher than it was a year ago (Figure 1). The Lake is in the Low Flow Sub-band. According to RAINDAR, 1.25 inches of rain fell directly over the Lake during the past seven days. The surrounding watershed experienced generally higher rainfall amounts except for a small portion of the watershed northeast of the Lake where rainfall amounts were lower (Figure 2).

Based on USACE reported values, current Lake inflow is approximately 5,010 cfs. A breakdown of flows was not available at the time of this report.

Structure	Flow cfs
S65E	N.A.
S154	N.A.
S84 & 84X	N.A.
S71	N.A.
S72	N.A.
C5 (Nicodemus slough dispersed storage)	N.A.
S191	N.A.
S133 PUMPS	N.A.
S127 PUMPS	N.A.
S129 PUMPS	N.A.
S131 PUMPS	N.A.
S135 PUMPS	N.A.
Fisheating Creek	N.A.
S2 Pumps	N.A.
S3 Pumps	N.A.
S4 Pumps	N.A.

Current Lake outflow is approximately 4,256 cfs exiting at S77 (2,433 cfs), S308 (1,487 cfs) and to the L8 canal through Culvert 10A (336 cfs). Water supply demands remain low in the EAA. Corrected evapotranspiration value based on the L006 weather platform solar radiation data for this past week was 3.700 cfs.

Change in elevation equivalents and average weekly flows for major structures are presented in Figure 3. Weekly average values for S77 and S308 are based on USGS data for the below structure gauges.

June chlorophyll and microcystin data are presented in Figure 4. Three nearshore stations and four pelagic stations had chlorophyll concentrations indicative of bloom conditions. All six of the stations monitored for microcystin had toxin concentrations above the detection limit. The most recent MODIS satellite images for June 24 and 26 indicate the continued existence of algal bloom development across a large portion of the central pelagic zone (Figure 5) and are in general agreement with field based values for the same time period.

Water Management Recommendations

The winter/spring dry season has ended and despite continued releases through S77 and S308 and seasonally high evapotranspiration, Lake stage increased by 0.05 feet over the past week. It is unclear whether any additional short-term recession of Lake stage is to be anticipated unless it results from USACE management actions or unusually dry climatic conditions. The current Lake stage is too high for this time of year, which may result in an increased loss of submerged aquatic vegetation. There also appears to be an increase in the occurrence of cyanobacterial blooms and associated elevated toxin levels. Future short-term recommendations are highly dependent on the near-term rainfall patterns and amounts. The goal should be to limit the rate of Lake stage increase or initiate an unseasonable recession in Lake stage to avoid exceeding the top of the preferred stage envelope (15.5 feet NGVD) during the wet season.

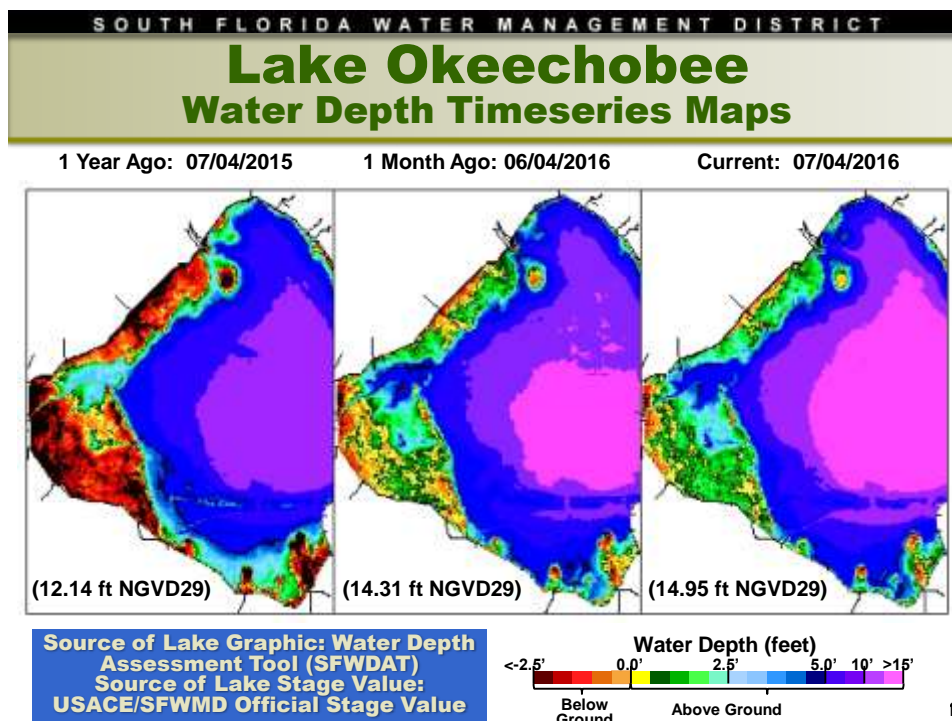
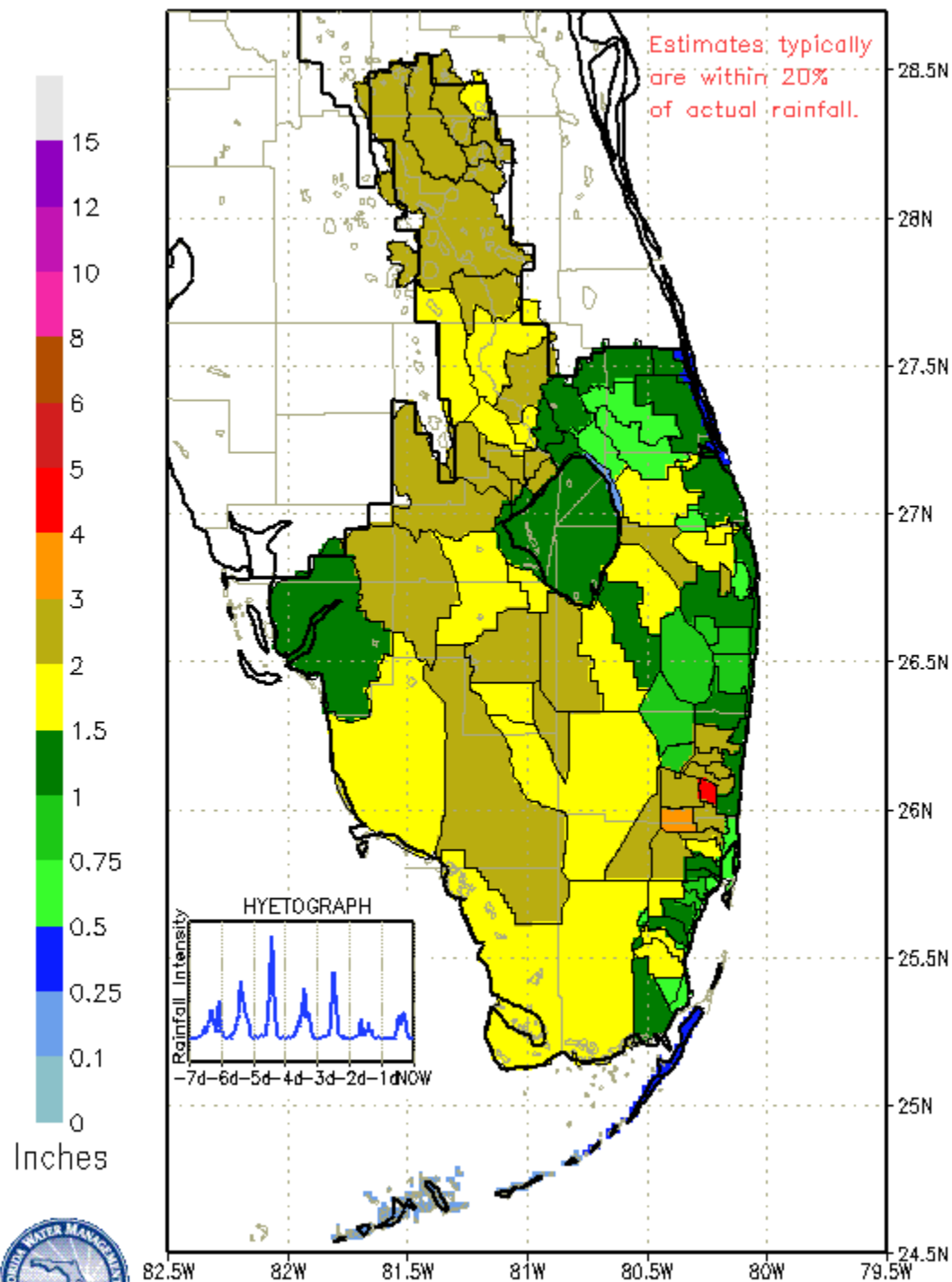


Figure 1

SFWMD PROVISIONAL RAINDAR 7-DAY BASIN RAINFALL ESTIMATES

FROM: 0215 EST, 06/28/2016

THROUGH: 0215 EST, 07/05/2016



DISTRICT-WIDE RAINFALL ESTIMATE: 1.753"

Figure 2

INFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S65E	2845	0.094
S71 & 72	903	0.030
S84 & 84X	651	0.021
Fisheating Creek	1141	0.038
Rainfall	N.A.	0.104
OUTFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S77	2186	0.072
S308	1529	0.050
S351	0	0.000
S352	0	0.000
S354	0	0.000
L8	333	0.011
ET	3700	0.122

Figure 3

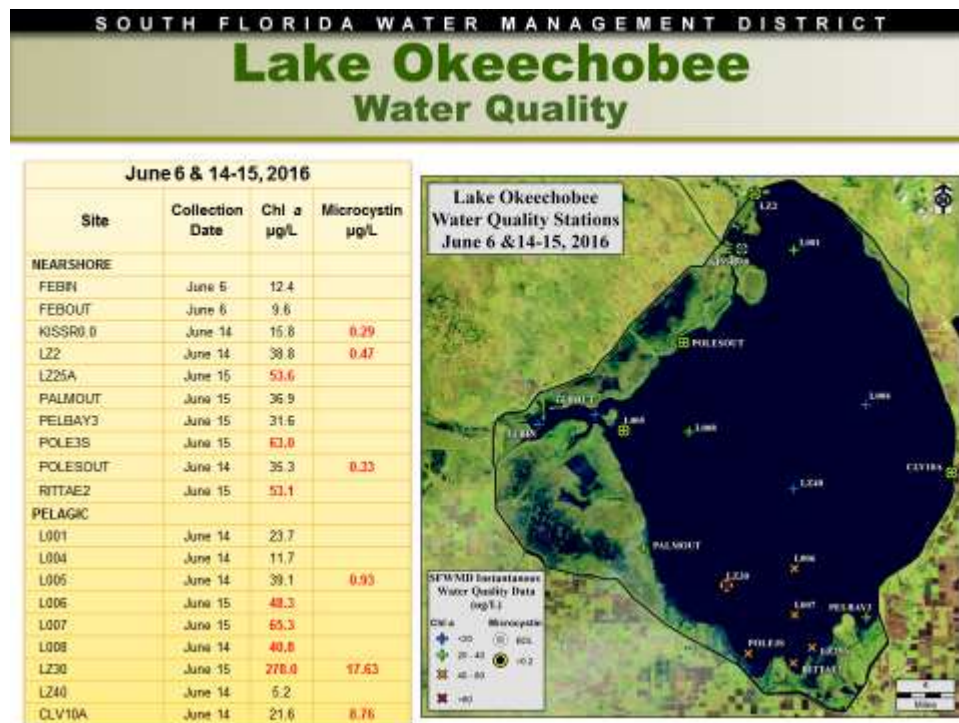


Figure 4

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Lake Okeechobee

Algal Blooms

Unvalidated and Experimental Data

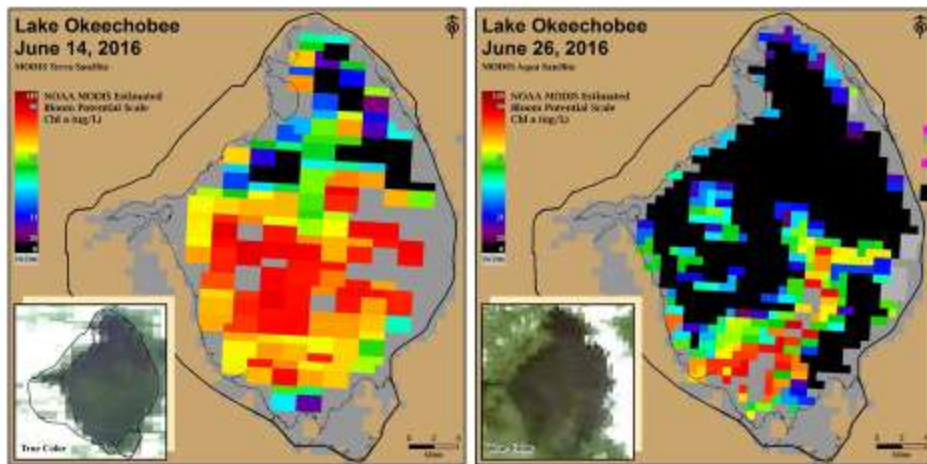


Figure 5

Lake Istokpoga

The Lake Istokpoga regulation schedule has returned to its annual low pool stage of 38.25 feet NGVD. Lake stage is 38.26 feet NGVD and is currently 0.01 feet above regulation (Figure 6). Average flows into the Lake from Arbuckle and Josephine creeks were 595 and 228 cfs respectively, the second week of declining flows. Average discharge from S68 and S68X this past week was 1,350 cfs, an increase from the preceding week. According to RAINДАР, 1.84 inches of rain fell in the Lake Istokpoga watershed during the past seven days.

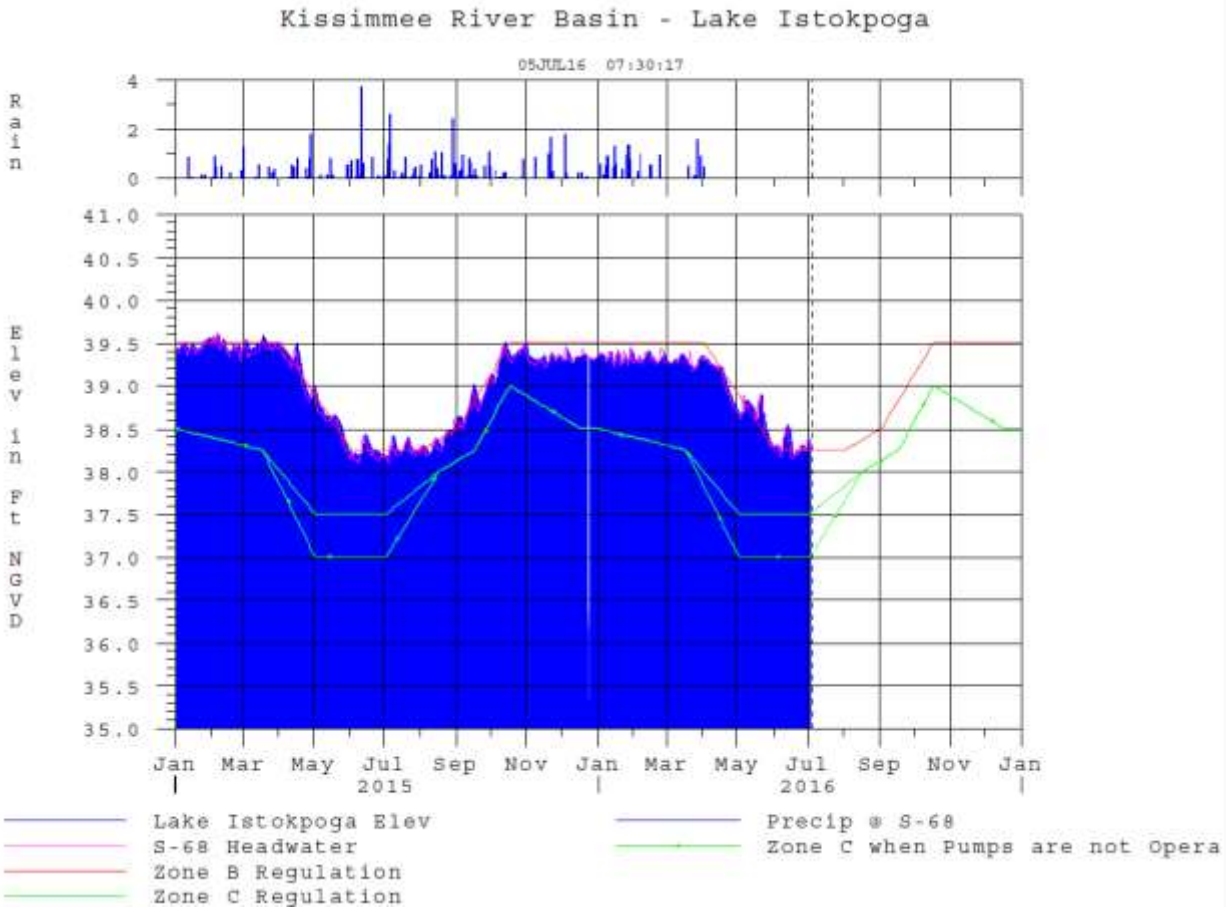


Figure 6

ESTUARIES

St. Lucie Estuary

Over the past week, provisional flows averaged about 1,859 cfs at S-80, 1,727 cfs downstream of S-308, 220 cfs at S-49 on C-24, 124 cfs at S-97 on C-23, and 119 cfs from Ten Mile Creek at the Gordy Road Structure. Average inflow from tidal basin tributaries is estimated to be 446 cfs (Figures 1 and 2). Total inflow averaged about 2,768 cfs last week and 3,705 cfs over last month.

Over the past week, salinity increased throughout the estuary (Table 1, Figures 3 and 4). The seven-day moving average salinity of the water column at the US1 Bridge is about 4.0. Salinity conditions in the middle estuary are in the poor range for the adult eastern oyster and have been for 41 consecutive days.

Table 1. Seven-day average salinity at three monitoring stations in the St. Lucie Estuary. Current average is in bold face type, previous average in parentheses. The envelope reflects the preferred salinity range for adult eastern oysters (*Crassostrea virginica*) in the middle estuary.

Sampling Site	Surface	Bottom	Envelope
HR1 (N. Fork)	0.8 (0.5)	1.7 (0.6)	NA ¹
US1 Bridge	2.9 (1.5)	5.0 (2.8)	10.0-26.0
A1A Bridge	12.5 (9.9)	19.0 (18.9)	NA

¹Envelope not applicable

Caloosahatchee Estuary

During the past week, provisional flows averaged approximately 3,186 cfs downstream of S-77, 3,375 cfs at S-78, and 6,203 cfs at S-79. Average inflow from tidal basin tributaries is estimated to be 954 cfs (Figures 5 and 6). Total inflow averaged 7,157 cfs last week and 9,099 cfs over last month.

Over the past week, salinity remained about the same throughout the estuary (Table 2, Figures 7 and 8). The seven-day average salinity values are within the good range for adult oysters at Shell Point and at Sanibel and has been in the poor range at Cape Coral for 42 consecutive days (Figure 9). The 30-day moving average surface salinity is 0.2 at Val I-75 and 0.2 at Ft. Myers. Salinity conditions at Val I-75 are in the good range for tape grass.

Table 2. Seven-day average salinity at six monitoring stations in the Caloosahatchee Estuary. Current average is in bold face type, previous average in parentheses. The envelope reflects the preferred salinity range for tape grass (*Vallisneria americana*) at Val I-75 and for adult eastern oysters (*Crassostrea virginica*) elsewhere.

Sampling Site	Surface	Bottom	Envelope
S-79 (Franklin Lock)	0.2 (0.2)	0.2 (0.2)	NA ¹
Val I75	0.2 (0.2*)	0.2* (0.2*)	0.0-5.0 ²
Ft. Myers Yacht Basin	0.2 (0.2)	0.2 (0.2)	NA
Cape Coral	0.2 (0.3)	0.3 (0.4)	10.0-30.0
Shell Point	8.3 (8.6)	12.3 (14.7)	10.0-30.0
Sanibel	21.5 (21.7)	25.0 (25.1)	10.0-30.0

¹Envelope not applicable, ²Envelope is based on a 30-day average.

*Val I75 is temporarily offline due to bridge construction,

Salinity values are estimated using models developed for this site.

Monitoring data collected by the River, Estuary and Coastal Observing Network of Sanibel-Captiva Conservation Foundation using continuous sensors are summarized in Table 3 as concentration ranges of Chlorophyll *a* and dissolved oxygen at Beautiful Island, Ft. Myers, and Shell Point in the Caloosahatchee Estuary.

Table 3. Weekly ranges of Chlorophyll *a* (a measure of algal biomass) and dissolved oxygen concentrations at three monitoring stations maintained by the Sanibel-Captiva Conservation Foundation.

	RECON Monitoring Stations		
	Beautiful Island	Ft. Myers	Shell Point
Chlorophyll <i>a</i> (µg/l)	5.66 – 5.95	2.6 – 5.5	3.0 – 9.5
Dissolved Oxygen (mg/l)	2.6 – 4.7	3.98 – 5.15	4.3 – 6.5

The Florida Fish and Wildlife Research Institute reported on July 1, 2016, that *Karenia brevis*, the Florida red tide organism, was not detected in samples collected from Lee County.

Water Management Recommendations

Given the current estuarine conditions, there are no ecological benefits associated with additional releases from Lake Okeechobee.

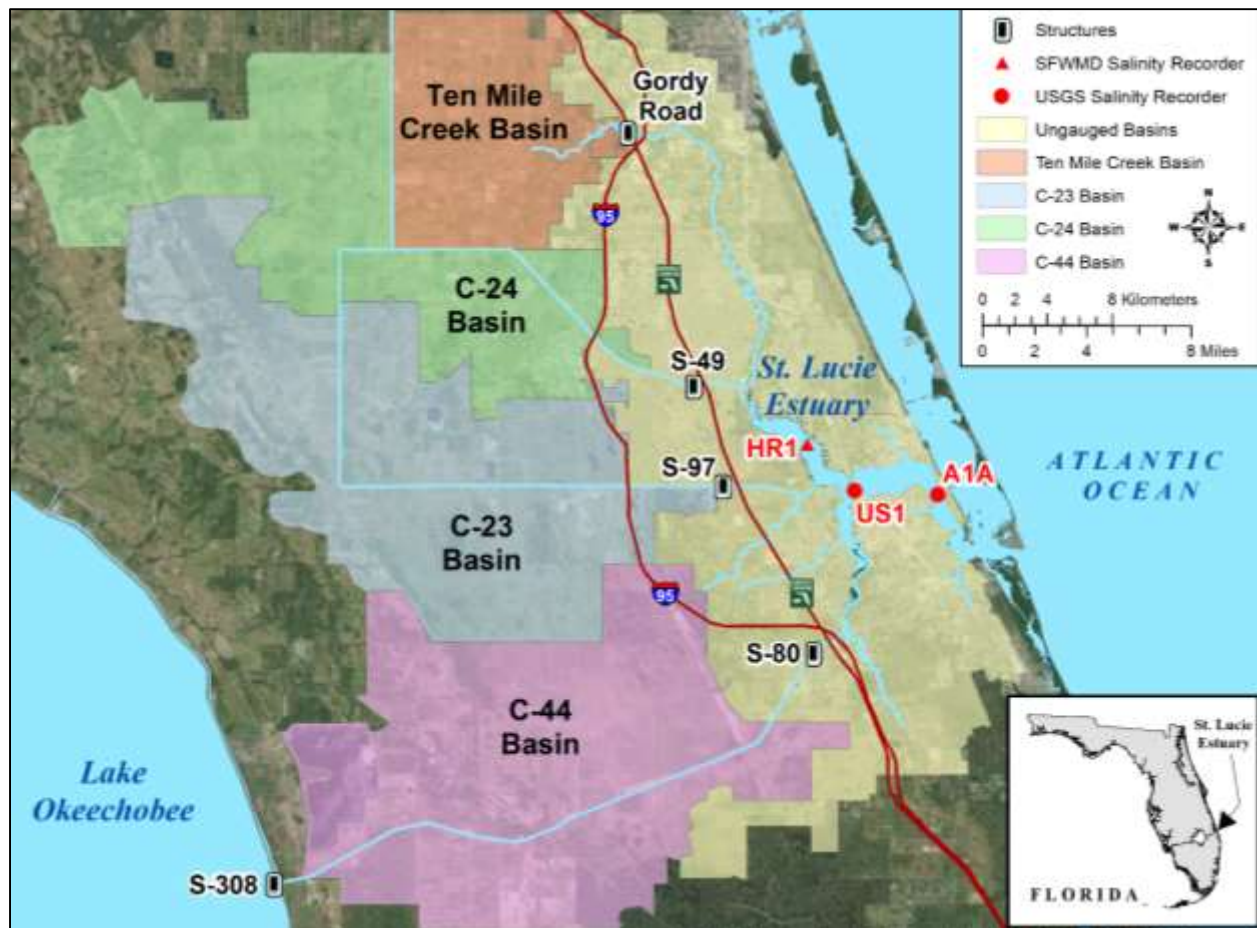


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

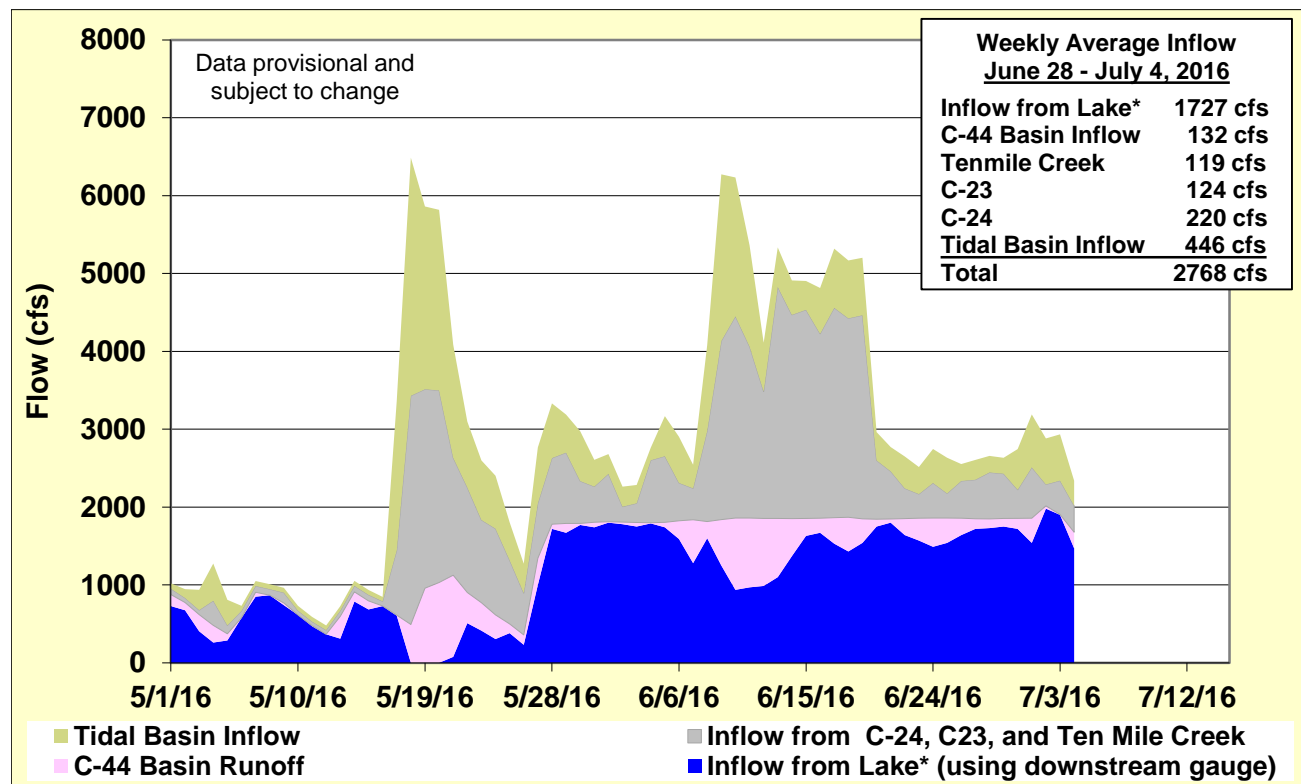


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

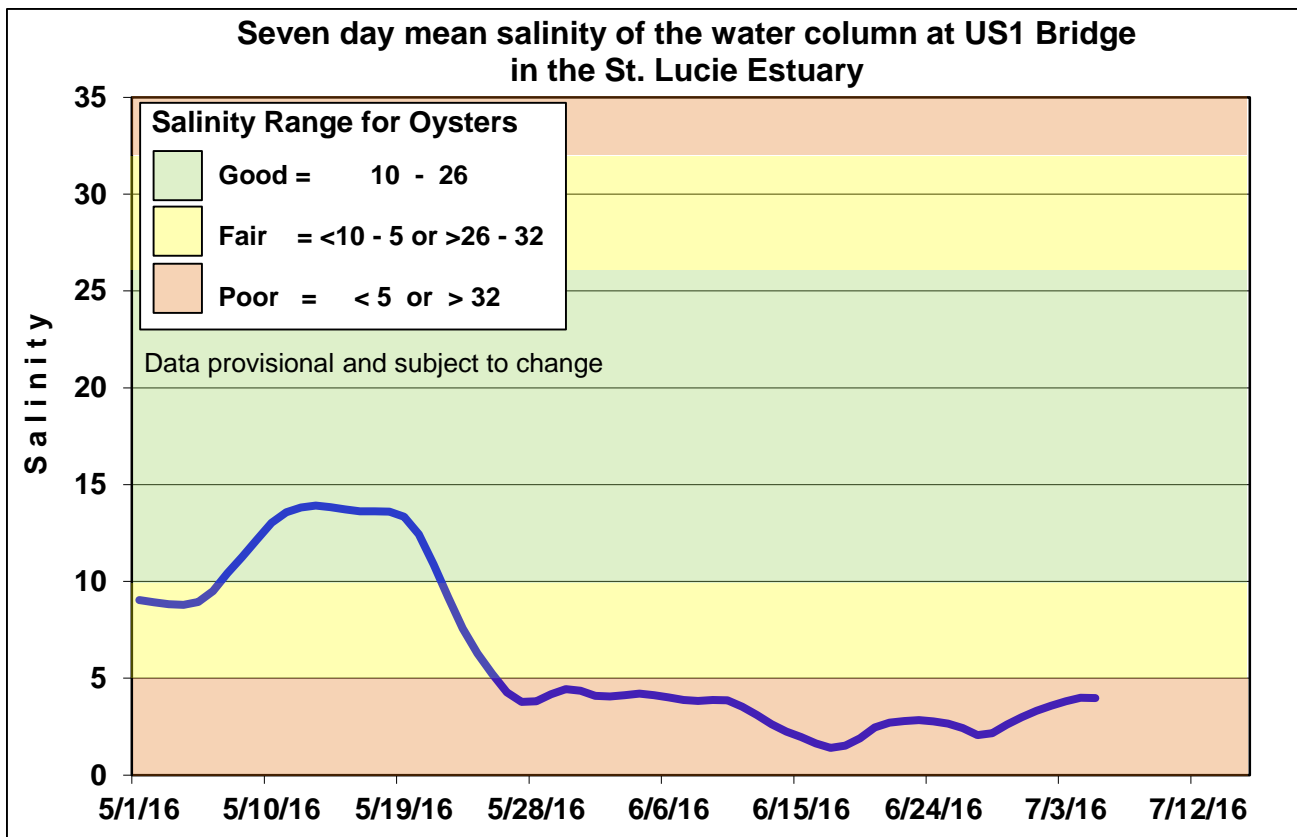


Figure 3. Seven-day mean salinity of the water column at the U.S. Highway 1 Bridge.

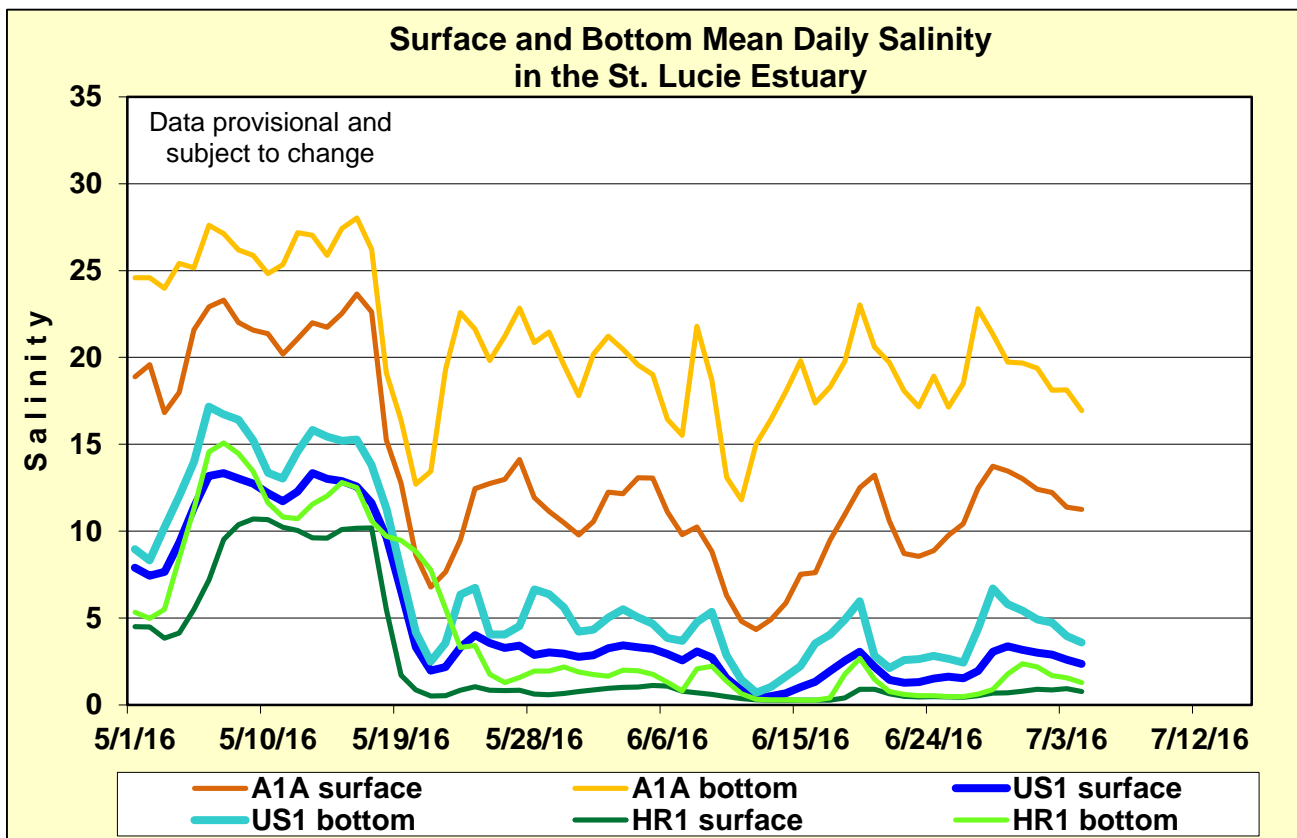


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

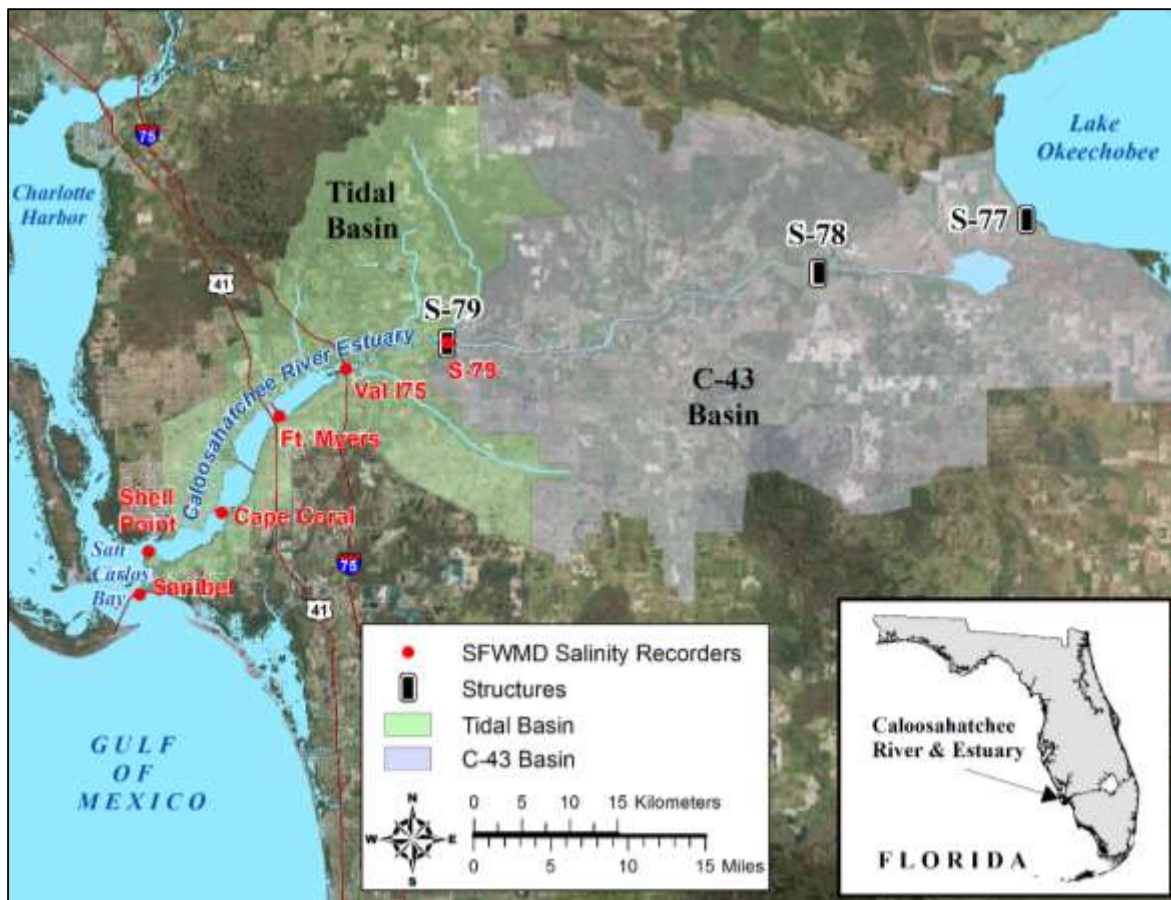


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

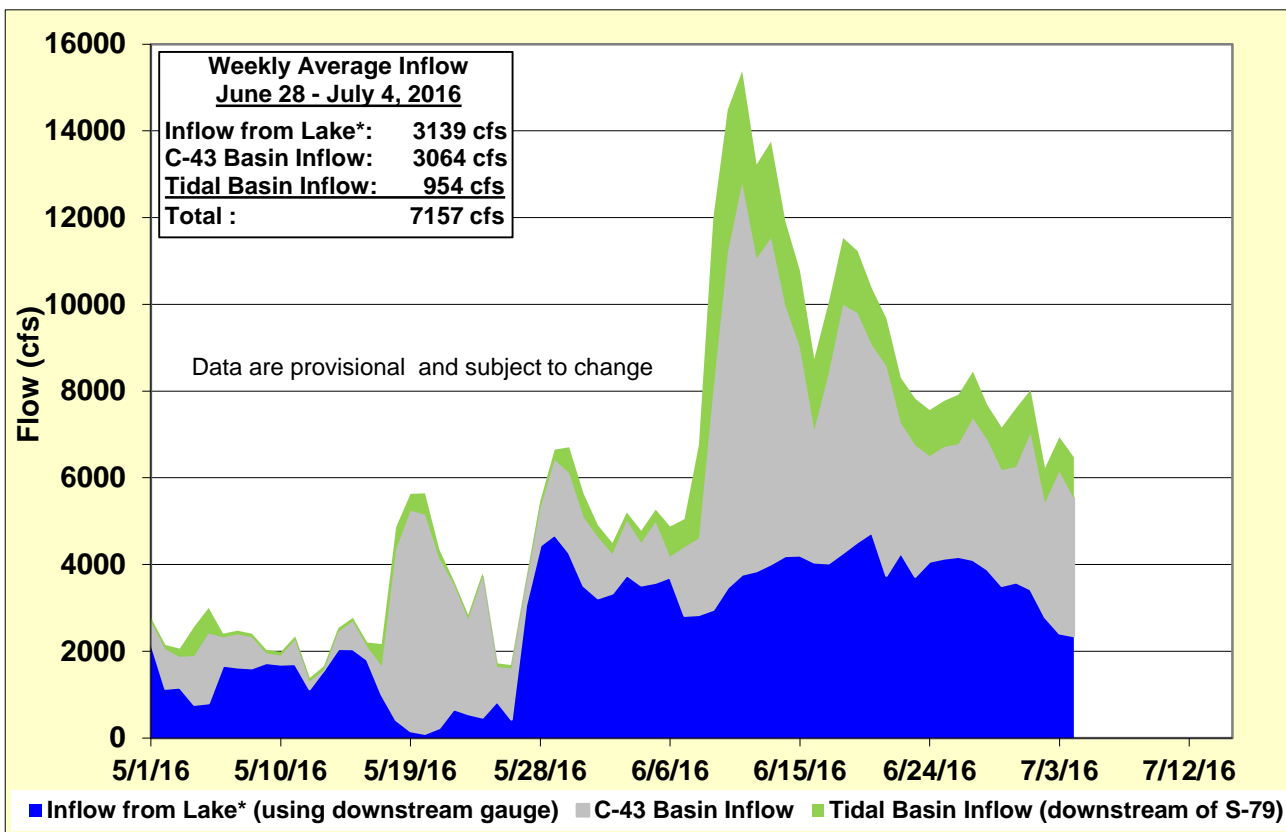


Figure 6. Freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.

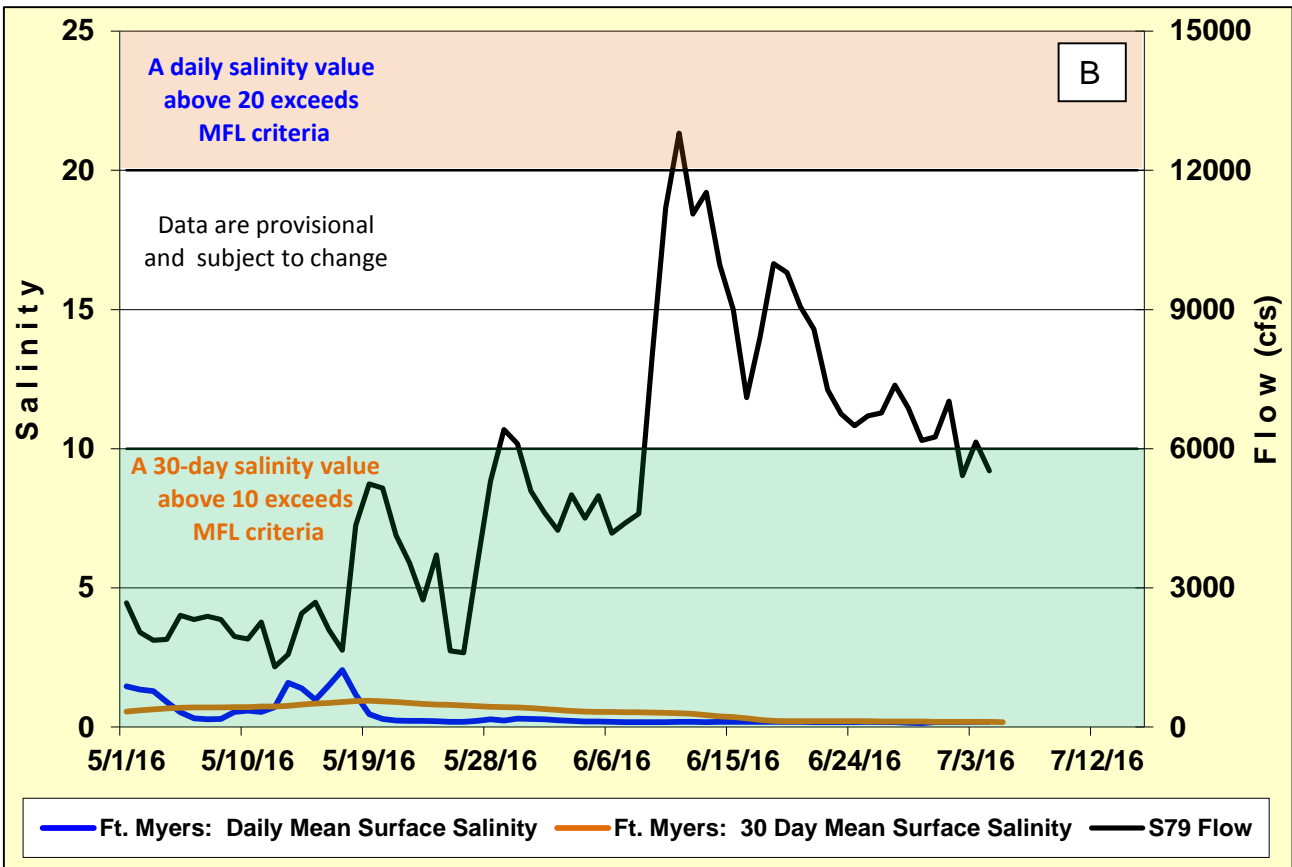
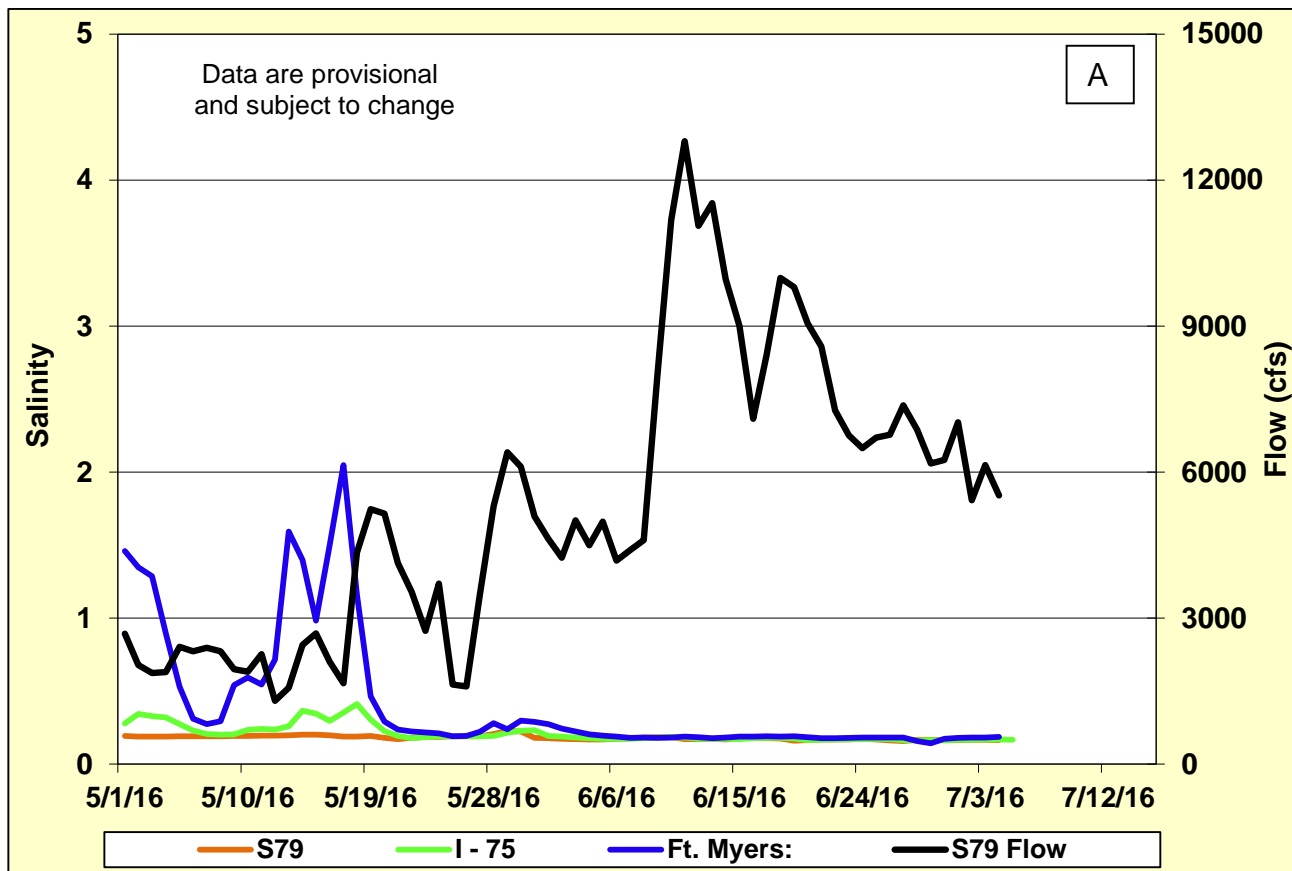


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations (A) and 30-day moving average salinity at Ft. Myers (B).

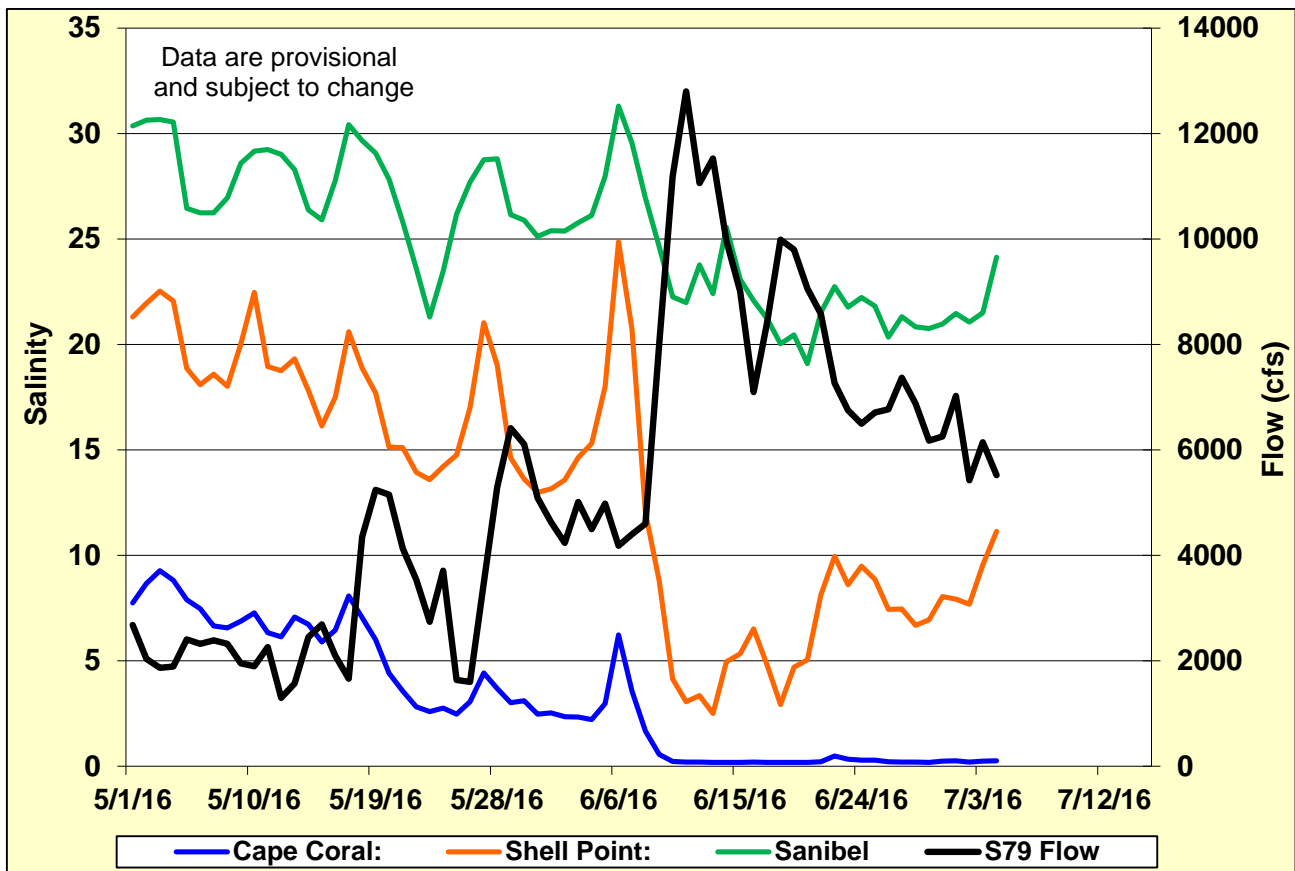


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

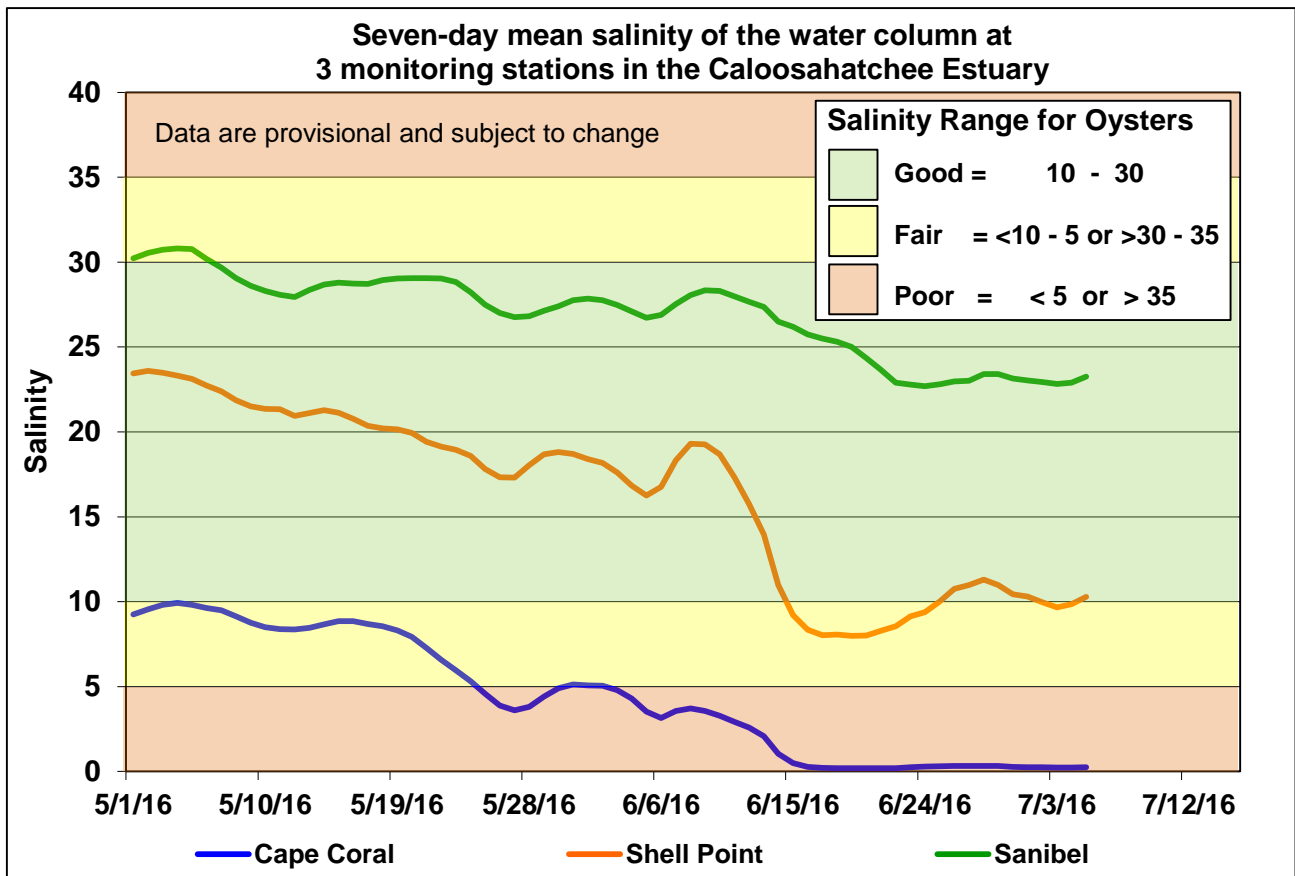


Figure 9. Seven-day mean salinity at Cape Coral Bridge, Shell Point and Sanibel Bridge monitoring stations.

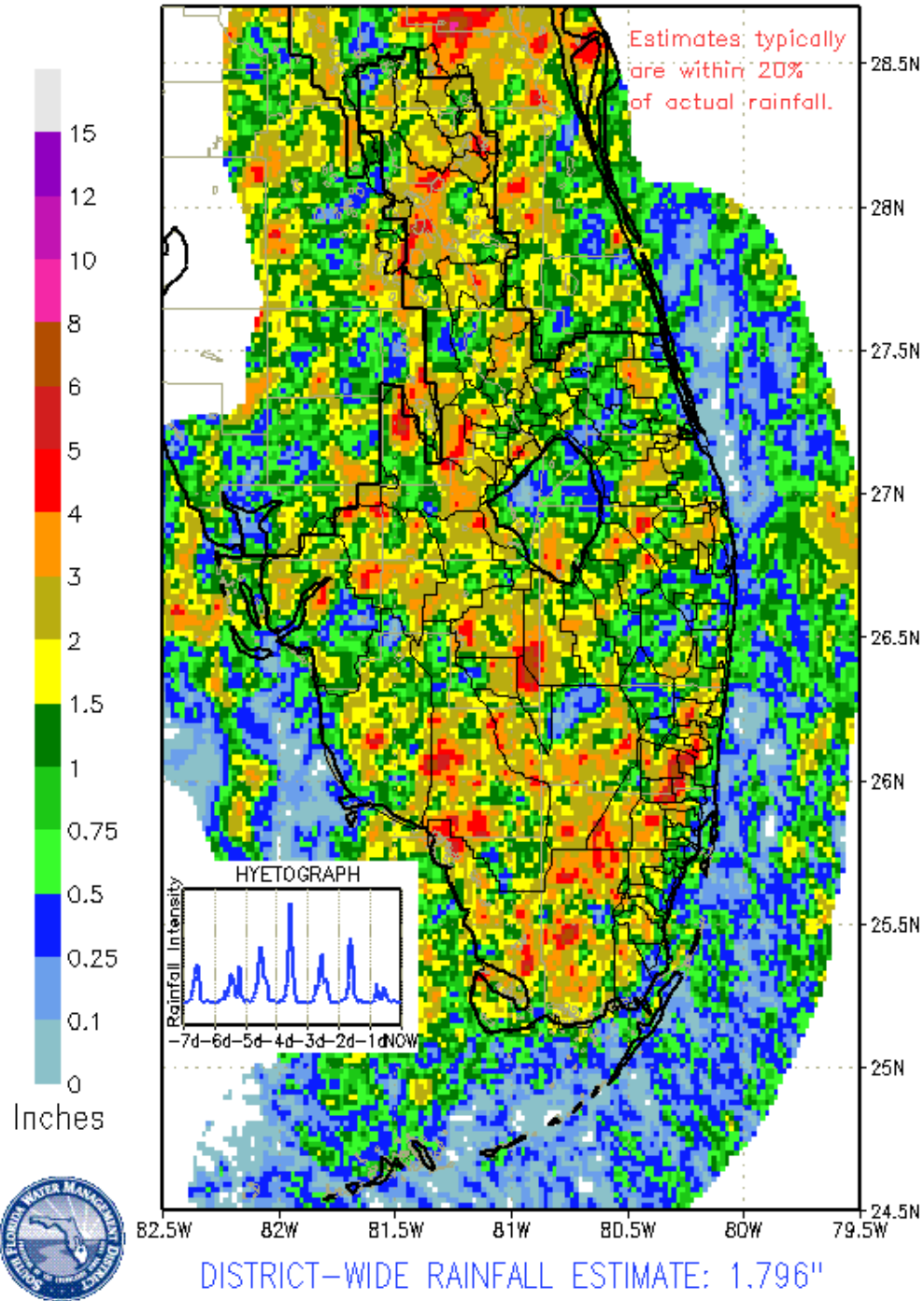
GREATER EVERGLADES

Rainfall was moderate last week with basin averages ranging from 0.87 to 2.61 inches. The local maximum was seven inches in Everglades National Park (ENP). Stage changes were mixed with the general pattern of decreasing in the north and increasing in the south.

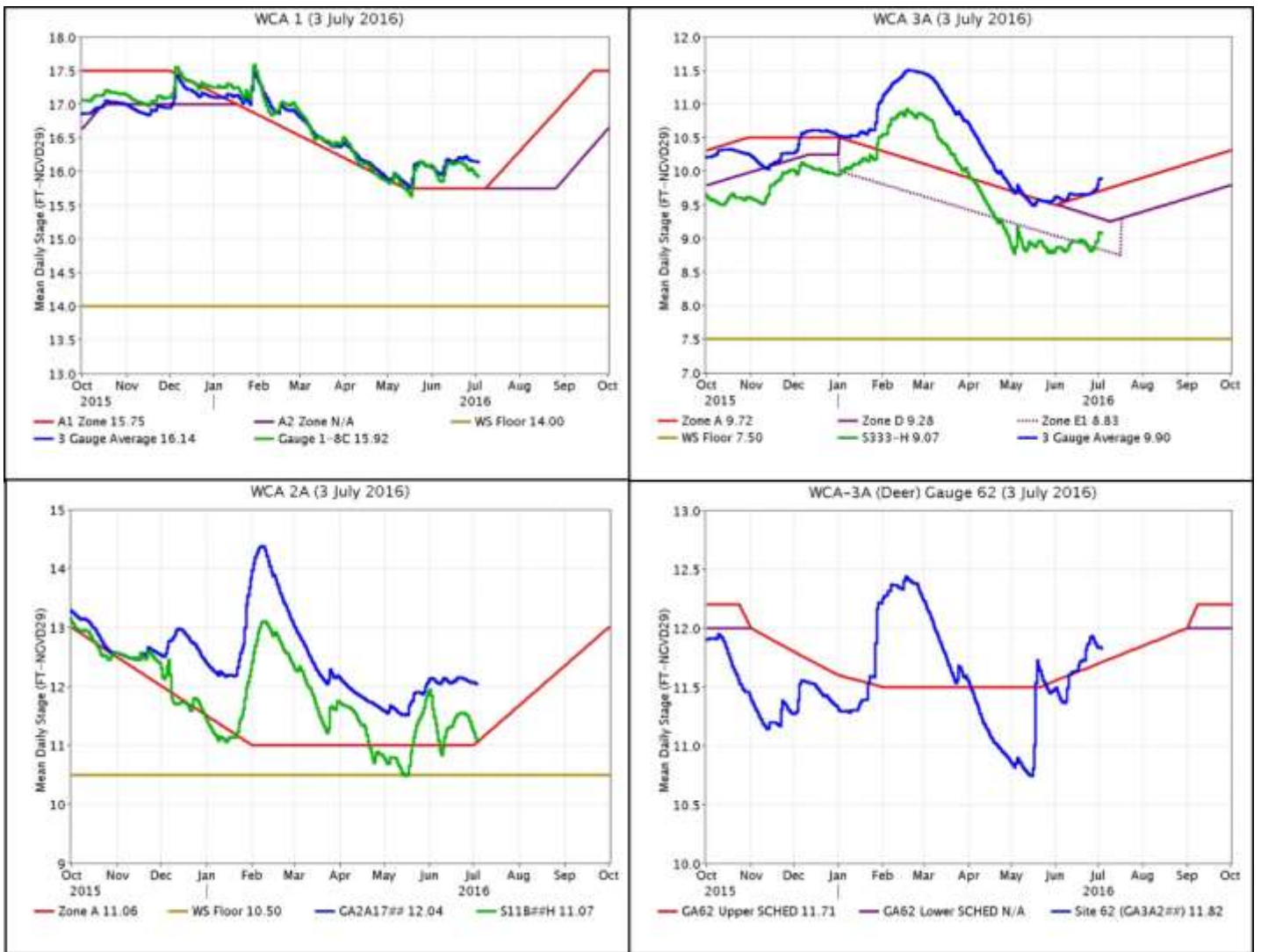
Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	1.13	-0.03
WCA-2A	0.87	-0.07
WCA-2B	0.91	0.04
WCA-3A	2.15	0.14
WCA-3B	2.61	0.17
ENP	2.36	0.26

SFWMD PROVISIONAL RAINDAR 7-DAY RAINFALL ESTIMATES

FROM: 0530 EST, 06/27/2016 THROUGH: 0530 EST, 07/04/2016

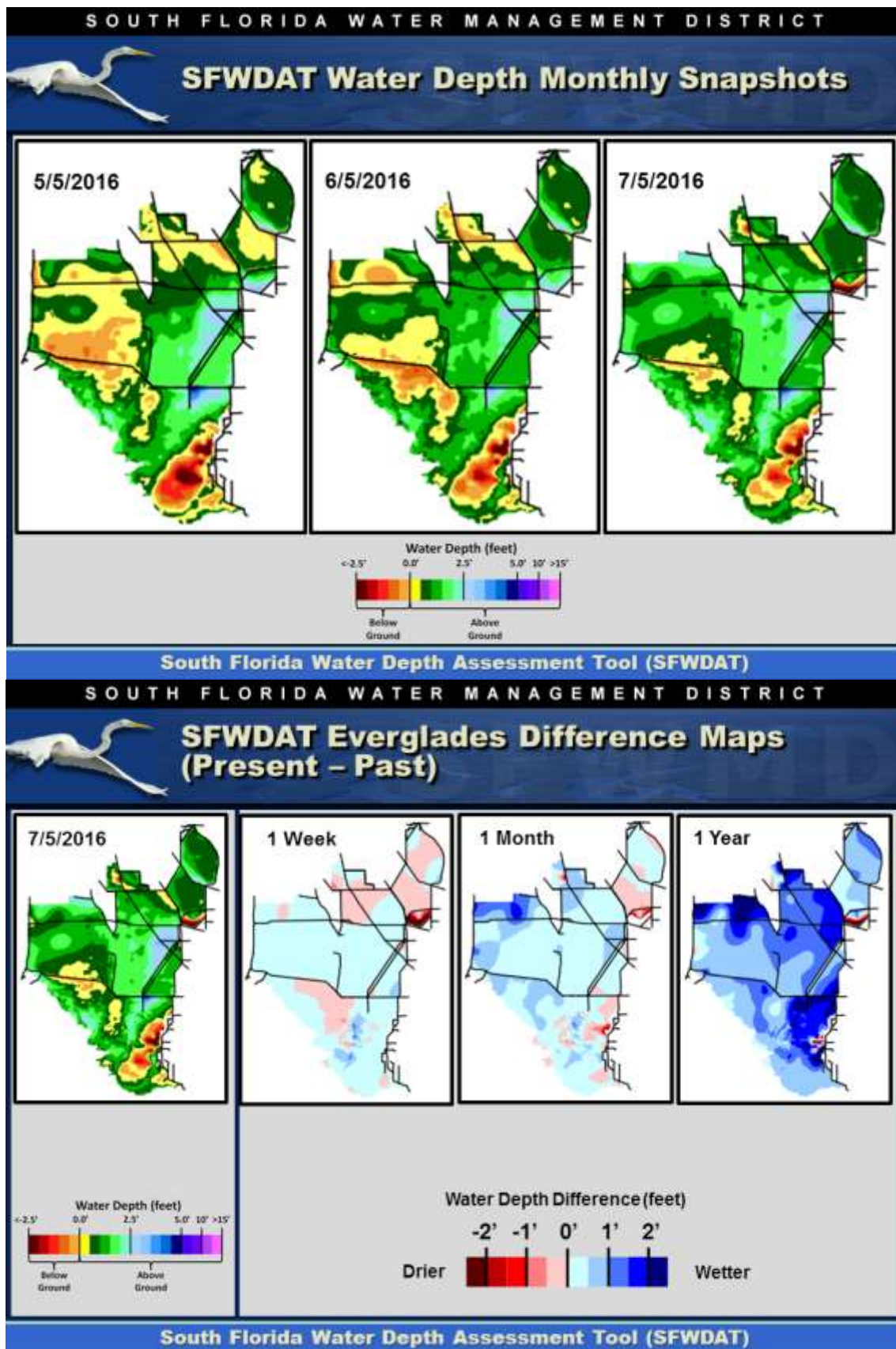


Regulation Schedules: Water levels remain above the regulation schedules but are closer to the regulation schedules than last week with the exception of WCA-3A. The WCA-1 three-gauge average is 0.39 feet above regulation. The WCA-2A stage is 0.98 feet above regulation. The WCA-3A three-gauge average stage is 0.18 feet above regulation and the northwestern WCA-3A gauge stage (gauge 62) is 0.11 feet above schedule.



Water Depths and Changes: Water levels are higher than a month and two months ago. Water depths at the monitored gauges (except WCA-2B) range from 0.93 to 2.00 feet (in southern WCA-3A).

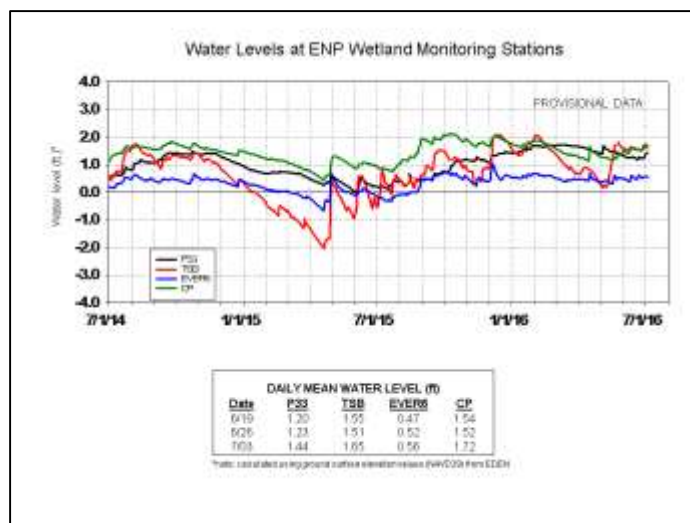
Stage changes were mixed again last week, but mostly increased. A broken gauge in WCA-2B is causing the data discrepancies there. Gauge changes ranged from -0.12 feet to 0.33 feet. Compared to a month ago, stages are higher in most areas. Almost all areas are slightly to over two feet higher than a year ago.



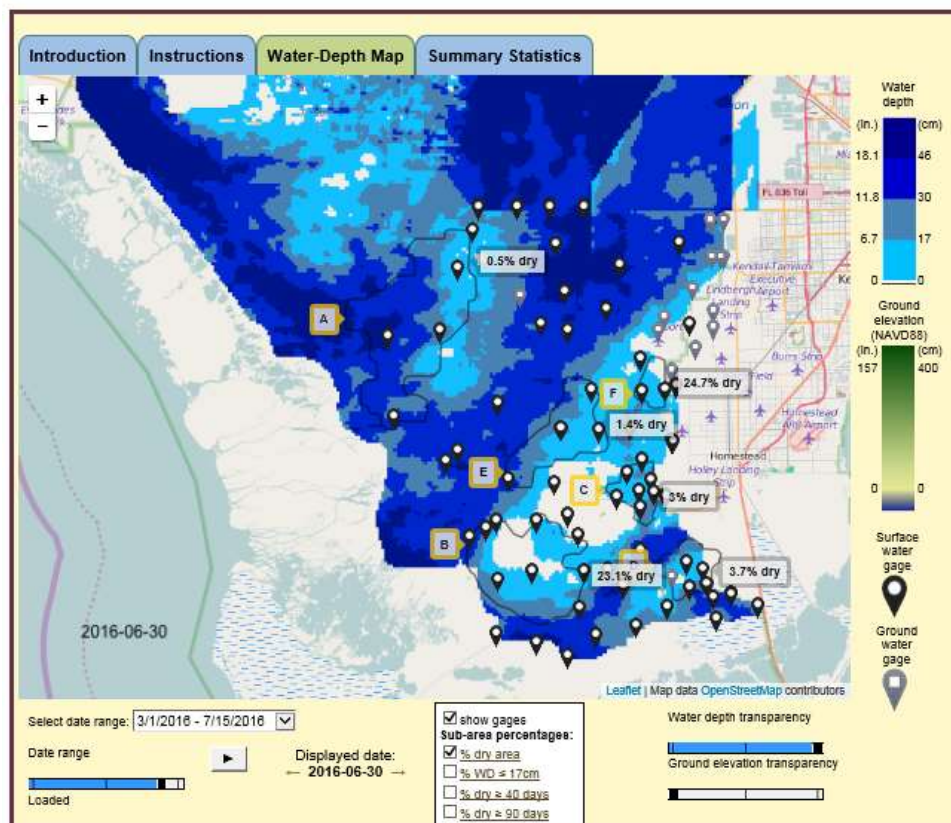
Wading birds: No new information.

Snail Kites: No new information.

Cape Sable Seaside Sparrows: Percent dry area decreased in all subpopulation areas this week with the exception of Subpopulation D, which stayed the same.



Cape Sable Seaside Sparrow (CSSS) Viewer

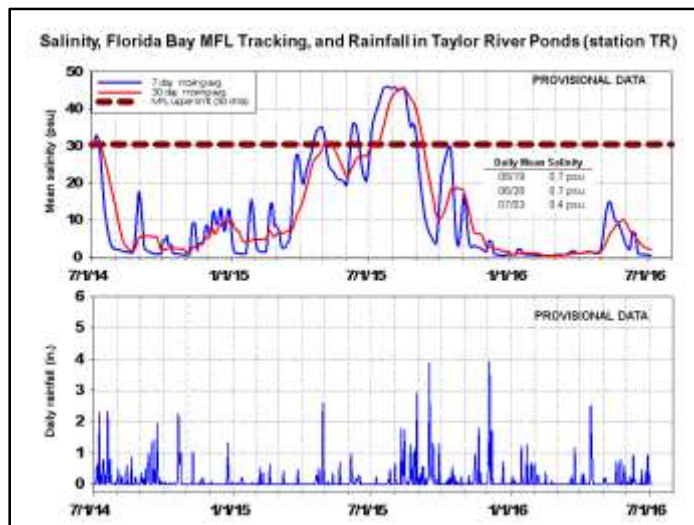
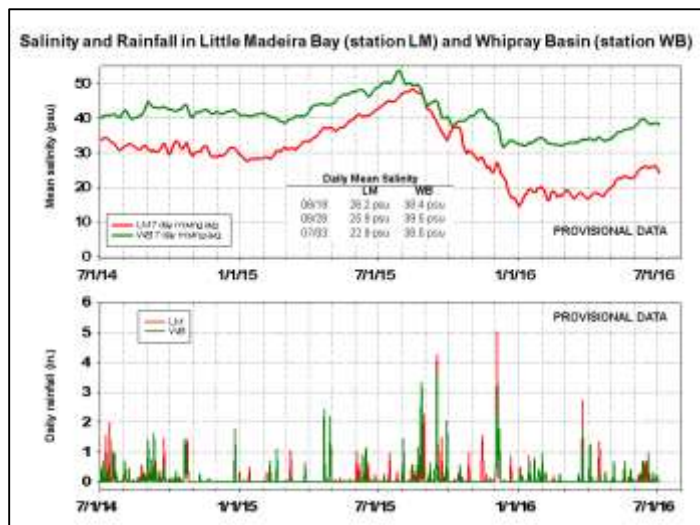


6/26/2016: CSSS-A 11.5%; CSSS-B 36.4%; CSSS-C 3.4%; CSSS-D 3.7%; CSSS-E 2%; CSSS-F 28.1%

Everglades National Park (ENP) and Florida Bay: Water levels rose across ENP with the largest change in northeast Shark River Slough. Water levels are higher than a month ago and above average in all areas by three to nine inches.

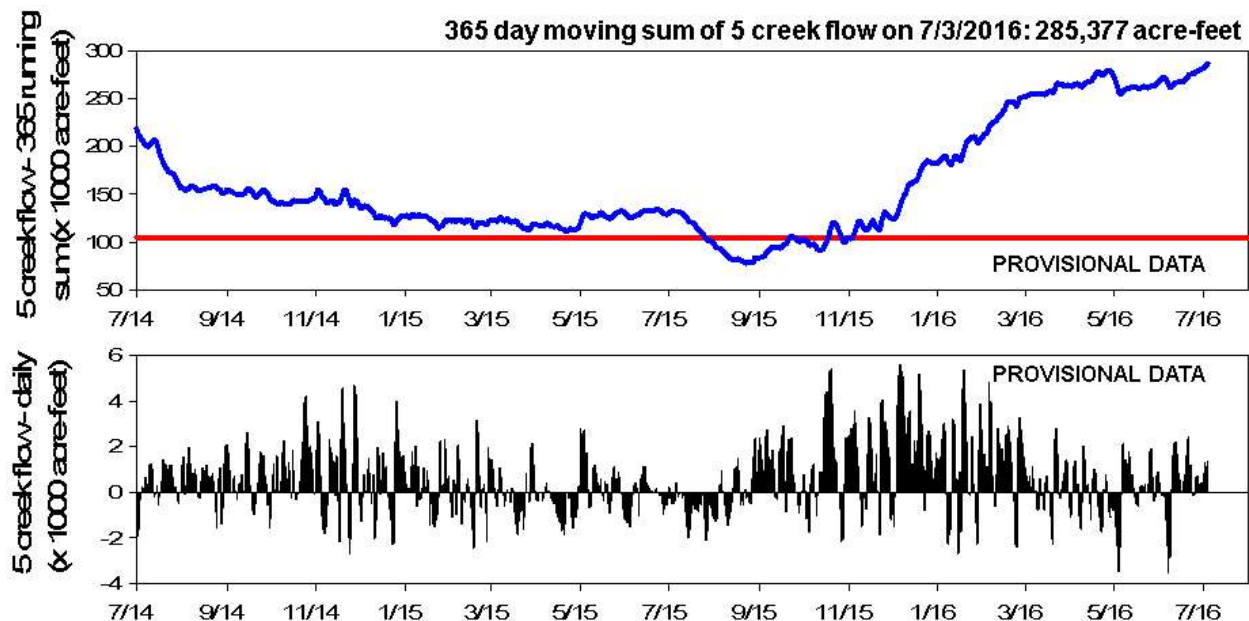
Salinities mostly decreased across Florida Bay with the largest change being a decrease of -5.5 psu in the western nearshore embayments. Daily average salinities range from 18 to 38 psu with the highest salinity in central Florida Bay. All areas of the bay are within 3.6 psu of their historic averages.

The MFL sentinel site TR in the mangrove zone remains near fresh at 0.4 psu. The 30-day moving average salinity at TR decreased to 2.2 psu.



The 365-day running summed cumulative flow from the five creeks feeding Florida Bay increased to 285,377 acre-feet (above the average of 257,628 acre-feet). Creek flow is provisional data from the USGS and is highly variable.

5 Creek Cumulative Flow and Florida Bay MFL Flow Criteria Tracking



Water Management Recommendations

- Throughout the wet season, water depths should remain below 2.5 feet through far southern WCA-3A to protect tree island forests.
- Limit ascension rates to a maximum of 0.25 feet/week to protect habitat and wildlife, including the apple snail.

Recommendations appear in the summary table below. The red text represents new or modified information or recommendations.

Everglades Ecological Recommendations, July 5th, 2016 (red is new)				
Area	Current Condition	Cause(s)	Recommendation	Reasons
WCA-1	Stages changed -0.12' to +0.03'	Rainfall, ET, management	Limit ascension rates to extent possible with a maximum of 0.25 ft/week.	Ascension rates of <0.25'/week will protect habitat and wildlife including reproducing apple snails.
WCA-2A	Stage fell -0.07'	Rainfall, ET, management	Begin wet season operations for this area, including maintaining ascension rates <0.25 ft/week	Ascension rates of <0.25'/week will protect habitat and wildlife including reproducing apple snails.
WCA-2B	Stages rose 0.03' to 0.05'	Rainfall, ET, management	Follow normal seasonal practices. Limit ascension rates to extent possible with a maximum of 0.25 ft/week.	Ascension rates of <0.25'/week will protect habitat and wildlife including reproducing apple snails.
WCA-3A NE	Stage rose 0.18'	Rainfall, ET, management	Limit ascension rates to extent possible with a maximum of 0.25 ft/week.	Ascension rates of <0.25'/week will protect habitat and wildlife including reproducing apple snails.
WCA-3A NW	Stage fell -0.10'	Rainfall, ET, management		
Central WCA-3A S	Stage rose 0.23'	Rainfall, ET, management	Limit ascension rates to extent possible with a maximum of 0.25 ft/week. Water depths should remain below 2.5 feet over this upcoming wet season. When flows are changed a gradual reduction is recommended (stepping down over several days).	Moderate recession rates would benefit habitat and wildlife. Keeping depths below 2.5' is important to allow tree island vegetation to recover from stress of the recent extended inundation duration. Ascension rates of <0.25'/week will protect habitat and wildlife including reproducing apple snails.
Southern WCA-3A S	Stage rose 0.23'	Rainfall, ET, management		
WCA-3B	Stages changed 0.02' to 0.33'	Rainfall, ET, management	Follow normal seasonal practices. Limit ascension rates to extent possible with a maximum of 0.25 ft/week.	Ascension rates of 0.25'/week will protect habitat and wildlife including reproducing apple snails.
ENP-SRS	Stage rose 0.26'	ET, rainfall, topography, management	Make discharges to the Park according to the ERTTP rainfall plan.	Keep peat wet to promote native habitat and maintain wetland plant and animal communities.
ENP-CSSS habitats	S-12A and S-12B remain closed to enhance dry-down.	Rainfall, ET, management	Follow rainfall plan for releases. Adhere to ERTTP closures for S12-A and B. Gradual reduction in flows through S333, S12C and D, as possible, is recommended (stepping down over several days). Reduced flows through S333 would benefit wildlife. Follow guidance in C-111 western spreader canal project operations manual.	Provide appropriate hydrological and habitat conditions for Cape Sable Seaside Sparrow breeding.
Taylor Slough	3 to 9 inches above average	Rain, ET, inflows	Move water southward as needed	Provide freshwater buffer for ecosystems and maintain low salinity conditions downstream
FB- Salinity	-3.6 psu below to +2.7 psu above average	Rain, ET, inflows, wind	Move water southward as needed	Maintain lower salinity levels.